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NEW SERIES.

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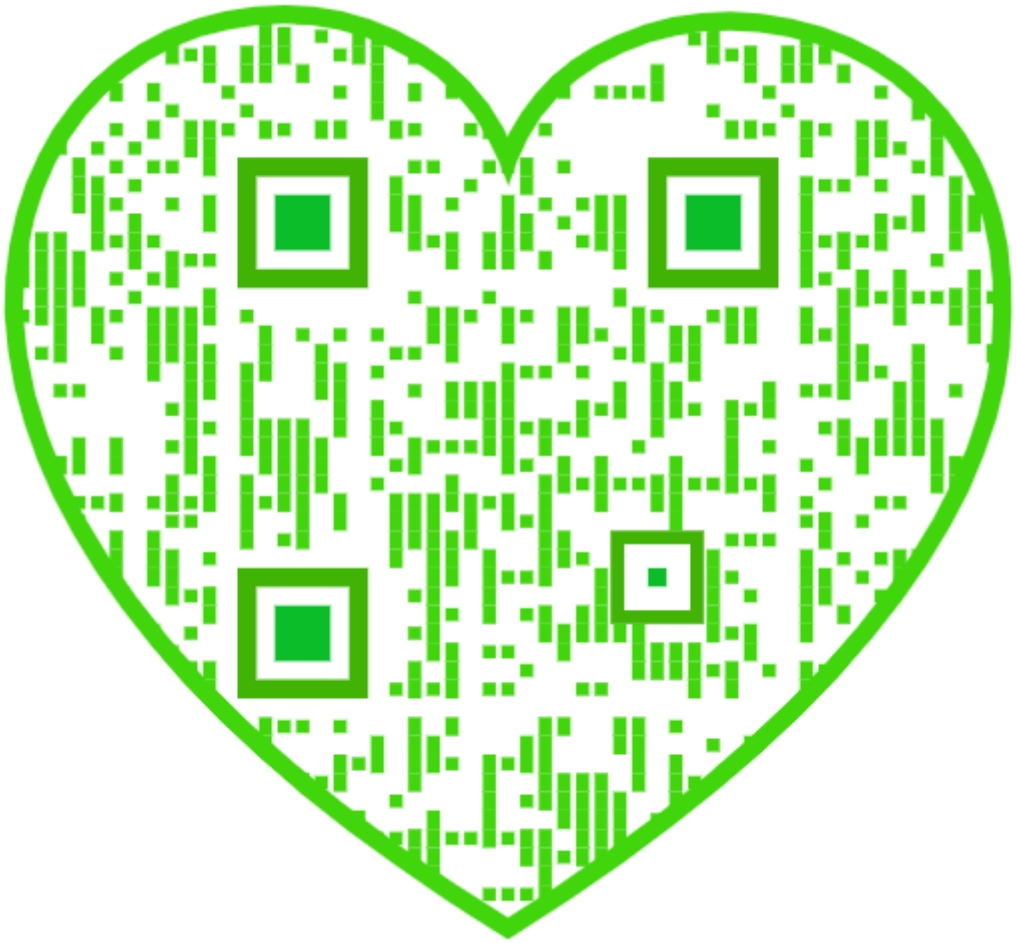

Scientific American.

A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES.

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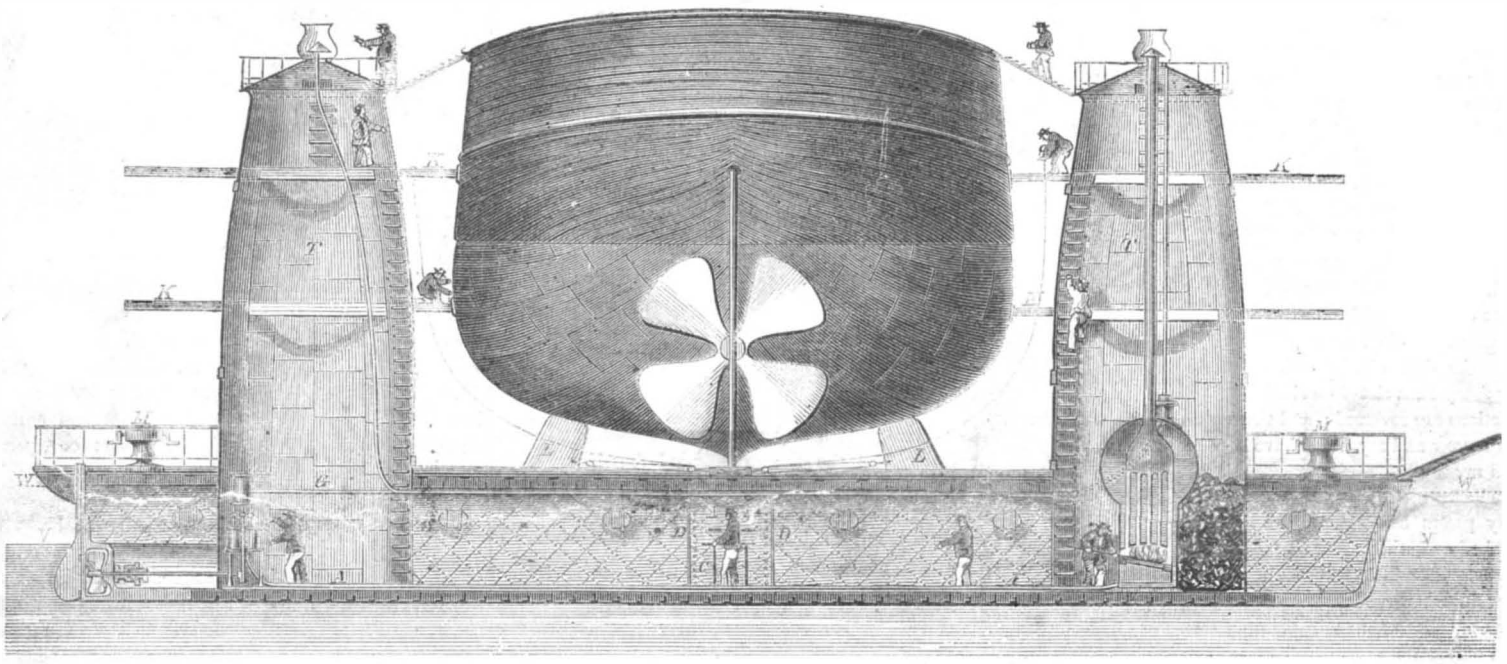
NYSTROM'S HYDRAULIC PONTOON DOCK.

The manipulation of large vessels for repairs at sea, the transportation of whole fleets through shallow water over a bar into a safe harbor, the unloading of ships and the raising of sunken ones (even of the largest size), can all be performed by the use of the "Hydraulic Pontoon Dock." The inventor is J. W. Nystrom, a citizen of Philadelphia, the author of an excellent work on propellers, and an old and highly ingenious client of ours, who is now residing at Odessa, in Russia, where he is engaged as engineer-in-chief to the Volga-Don Railway and Don-Azoff Steam Navigation Co., and consulting-engineer to the Russian Steam Navigation and Trading Co., and some other associations.

In the winter of 1856, the Grand Duke Constantine of Russia proposed building a dock or some other means for carrying large vessels built in St. Petersburg over the sandbanks of Cronstadt; and Mr. Nystrom then prepared drawings and a specification of the invention which forms the subject of this description, with a view of submitting them to the inspection of the Grand Duke. Circumstances, however, induced him to reserve his invention, which he subsequently much improved, during his travels in various parts of Europe, by the addition of such features of similar foreign apparatuses as he deemed best adapted to the localities in which his "Hydraulic Pontoon Dock" was to be employed.

Fig. 1 shows a vertical central section of the dock supporting a ship and Fig. 2 is a view of a number of them in the same position, so arranged that they could carry a ship over any shallow water to a harbor, or could support her for repairs. Let us now describe the arrangement. The pontoon, D D, is provided with two towers, T, which serve the same purpose as the balance tanks of the American sectional dock. In the center of the pontoon is a corridor about four feet wide, connecting the towers and containing the pipes, A, that communicate from the vertical boiler in the forward tower to the engine and steam pump in the aft tower. The pontoons are so arranged that the water can either be pumped out of the tanks in the ordinary way or may be forced out through the bottom by air being forced in on the top. C are the cocks which direct the flow of air to the different tanks, of which there are twelve. Each pontoon is provided with a propeller, and capstans, M, by which they can be moved from place to place and secured in any convenient or proper locality, or by them chains may be passed under a sunken vessel

Fig. 1

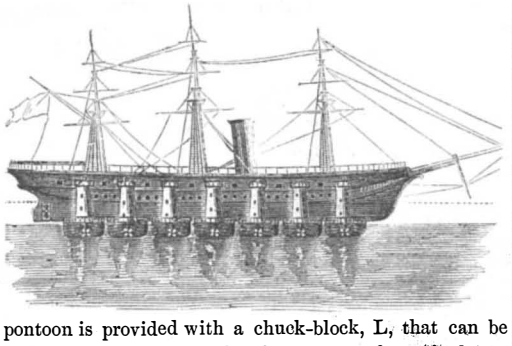


Although these pontoons may be constructed of any dimensions, the following proportions should about be maintained:—Length in water line, 100 feet; breadth of beam, 30 feet; hight from keel to deck, 10 feet; hight of towers from deck, 30 feet; diameter of towers at base, 15 feet. Each pontoon of these dimensions can lift 450

NYSTROM'S IMPROVED HYDRAULIC PONTOON DOCK.

and the latter elevated. V shows the depth to which they usually sink, and W the level of the decks of the pontoon; beyond that the towers balance her, and retain her in any position in the water, free access being always had between the machinery and the surface of the water; and should the arrangement require to be sunk below the tops of the towers, then a flexible air pipe can be attached to the one in the tower, and the pontoon can, if necessary, be operated at a depth of sixty feet of water. Each

Fig. 2



pontoon is provided with a chuck-block, L, that can be operated by cord and tackle from the surface, so that a ship may be steadied before the pontoons are elevated, and stays, K, project further through the towers to sustain the upheld ship. In raising a ship to dock it, the pontoons are sunk in a row to a sufficient depth to allow the ship to float between the towers, and the chuck-blocks being drawn up and such stays as are in reach fixed, the pontoons are then raised and the stays secured as they come above water, and when the whole is as seen in Figs. 1 and 2, the ship may be carried to any desired spot.

tuns dead weight, with engines of 20 horse power, which will work a propeller four feet in diameter. On the many and varied uses and advantages of this pontoon dock we have not space to dilate, as we have said as much perhaps as will interest the general reader; and such as are particularly interested in the invention can obtain more information by addressing J. W. Nystrom, care of American Steam Trade Co., Odessa, Russia. A patent is pending in this country.

A SHIP ON ROLLERS.

"Wonders will never cease" while this earth revolves on its airy axis, and *apropos* to this we must also conclude that "all fools are not dead yet." Of this we are certain from the description of a new steamer described in our excellent cotemporary, the London *Engineer*, proposed by J. A. Novello, of London, for navigating the ocean at the astonishing speed of fifty miles per hour. He is to accomplish this feat by placing his ship on revolving cylinders, which are to answer the same purpose on water that wheels do in railway carriages on land. By such a method of constructing his vessel he expects it to be rolled over the waves and not meet with the same amount of resistance which all wedge-shaped vessels encounter. Such a proposition is based upon erroneous views of the resistance of water to bodies passing through them. This resistance is in proportion to the submerged surface, and as cylinders or rollers in a vessel must present a greater extent of surface than the hulls of vessels as at present formed, of course, instead of increasing their speed, they will thereby have their speed greatly reduced. Wheels on a vehicle to be drawn or pushed through a soft element like water or snow are more injurious than beneficial. Just think of placing a sledge on wheels!

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RAILWAY NIGHTMARES.

Some men are born to be madmen, some to be idiots, some to be hanged; but *I* was born to be a railroad shareholder. Some men spend their money like noblemen and princes, some lose it at the gaming-table, some hide it in gardens, in wells, in brick walls, and die forgetting to reveal their secret; but *my* property is sunk for the benefit of my country in the Direct Burygold and the Great Deadlock Railways. While upon the one hand I am lowered to the condition of a beggar, on the other I am elevated to the rank of a patriot. What I have done would, in ancient days, have earned me a statue; but now, under unheroic forms of business, it is silently accepted as a matter of course. If I had sunk my property in endowing a hospital, I might have secured the immortality of a tablet and the gratitude of a committee; but my prodigal generosity has only taken the form of an investment. I sign a deed of settlement, pocket my liability, see my name recorded in a ledger of stockholders, and that is all.

Having no faith in reformers, I have joined no Committee of Investigation; I have subscribed to no society for improving our prospects. I have quietly accepted my position as a melancholy and accomplished fact. I have sold my withered shares for the trifle they would fetch; and having no family or kindred depending on me for support, I have taken to opium-eating.

I am surprised that I never turned my attention to this agreable investment before. Like my former ventures, it pays me no dividends, except in dreams; but then those dreams are of the most varied and amusing kind. They come to me without effort; they cry to me for no food; they make no calls. When they leave me, I feel no regret; for I know that a few pence will, at any time, call them back. Beggar as I am, I recline in all the state of kings; with no painful memories of yesterday, no care for to-day, no thought for to-morrow. Relieved from the dull checks and surroundings of active life, my fancy runs riot in a shadowy world, where all distinctions are reversed; and those things that were once my sorrow and my dread have now become my pleasure and my toys.

The long silent panorama of the Direct Burygold Railway passes before me; the whole line in Chancery, choked and stiffened by the dry, relentless hand of legal death. The Burygold station, once so full of life, is now an echoing, deserted cavern; its crystal roof is an arch of broken glass; its rails are torn away; its rooms and offices are empty or boarded up; and its walls are defaced with old ghastly time bills, the mocking records of its former wealth and activity. The long refreshment corridor is dusty and bare; its fixtures are rudely torn from the walls, its floor is strewn with remnants of placards and broken china; and nothing living is now left, except a wild half-famished cat, ravenously gnawing a bone as smooth as glass.

Passing out of this ruined station to the open line, I find no signs of traffic. Carriages are not to be seen, and the rails in places have been torn up by the roots. Rank grass has spread across the once busy way, and sheep are calmly browsing with no fear of coming danger. Breaking through a narrow cutting between two lofty hills, whose passage, once open and bare, is now grown over with under-wood and brambles, I emerge into a broad amphitheater of landscape, saddened with ruins, like the plains of ancient Greece, Standing at the extreme verge, upon the ragged edge of what was once a smooth lofty curving viaduct I gaze down far below into a winding stream whose course is broken and turned by the fallen arches which once spanned the broad deep valley. Large iron girders, spreading masses of brickwork, and blocks of heavy masonry, lie helplessly in the clear, glassy stream. In the distance another ragged edge of tall, narrow, broken arches issue ftom a cleft in the opposite mountain. The blue, misty hills close in the scene on every side; and the solemn stillness of undisturbed nature reigns over all. Struggling down the steep sides of this chasm, I pick my way across the ruins, to the divided limb of the railway on the further side. Here I turn for one final look at the silent valley, and then pursue my course.

I proceed a little further, when I come upon the broken parts of an old locomotive engine half-embedded in the side embankment. The boiler has been half-eaten away by the rust and the rats have made it their home. Close to this spot is the entrance to a long tunnel, the mouth of which is covered with a dense cobweb whose threads are thicker than stout twine. In the center of this cobweb are several huge overgrown spiders. I enquire of an old engine-driver, crippled for life by the "busting" of the engine "biler", is there no passage through this place? "What! the haunted tunnel," he answers with horror and astonishment; no man has dared to go through that for many years." Curiosity prompts me to advance nearer to the great cobweb and look through its open spaces to the dark cavern beyond. Perhaps the words of the old engineer have acted upon my imagination; but I think I see the outlines of smoke-colored human monsters, who coil around each other and seem hungry for prey. There is nothing fierce and active about their savagery, but it has that dreamy, listless, quiet, bone-crushing appearance of destructive power so fearful to contemplate in bears and certain monsters of the deep. Perhaps I am gazing on the spirits of departed Directors. Declining to go through this passage of horrors, I ascend the sides of the cuttings, pass along the road on the top of the haunted tunnel and descend upon the line once more upon the other side. Here I come upon life of a more genial kind. Squatters have taken possession of side stations; some are quite unoccupied; and one is in the temporary possession of a band of traveling showmen, whose caravan of wild beasts and curiosities are placed across the line. I past along under rotten bridges, and through groups of women and children assembled in the center of the road, until, at last, day dwindles into twilight and twilight gives place to a cold clear sky and a large moon. I come sometime after to a deep cutting, through a lofty wooded hill, the sides of which are rendered more gloomy by dark, overhanging fir trees. Winding along this narrow artificial valley for a considerable distance, I arrive at a sharp curve around the bend of the hill and see an exhibition almost as strange as any I have yet met with on the line. In the center of the valley between the rails, over which is suspended an enormous gypsy kettle. Numbers of men in strange stable-looking dresses are seated on each side of the valley, many of them drinking and nearly all of them smoking. In the distance beyond the fire are several four-horse stage coaches fully appointed, and around the fire, dancing wildly with joined hands, to the rough music of some half dozen Kent bugles, played by old half-resuscitated stage-coach guards, are some dozen aged stage coachmen dressed in the familiar garb of other days, It is a midnight picnic from some adjacent country-town, met to triumph over the fall, and to dance over the ruins of a paralysed railway. While I am gazing at the spectacle a number offresh roysterers, coming up from behind, sweep me into the middle of the dancing, drinking, shouting group, and I am immediately questioned as to my sudden and uninvited appearance. Almost before I have considered my reply, the fact of my being a ruined shareholder making the melancholy pilgrimage of my sunken property, seems to strike the whole company as if by inspiration; and I am welcomed with the loudest mocking laughter and the heaviest slaps on the back that the boisterous villagers are capable of administering. One dozen of men ask me in sarcastic chorus what has become of my "foine carriges," while another dozen ask me, also in chorus, where my "sixty mile a-hour be now?"

It is the morning of the second day when I reach the grand London terminus, now grand no longer; but showing its decay even more glaringly than the rest of the line. Its interior is vast, naked and deserted, and its exterior has long been given up to the mercy of the bill stickers. Its classical portico is a mass of unsightly blistered placards; its courtyard is silent and untrodden, except at the footsteps of a few old servants who yet live in the hope of seeing the old busy days revived.

ORIGIN OF THE BAYONET.

The Emperor Napoleon III. said in his proclamation: "The new rifle arms are only dangerous at a distance; they will not prevent the bayonet from being as heretofore the terrible arm of the French infantry." The bayonet is, in fact, an arm peculiarly French. It was invented, it is said, at Bayonne in 1641; and employed in 1670 in the regiment of the King's Fusiliers. It sensibly modified the system of military art in Europe, as it made cavalry less redoubtable to infantry, and caused the fire of lines of battle to cease to be regarded as the principal means of action. The bayonet has, in fact, become the decisive arm of the combat. According to a local tradition it was in a small hamlet in the environs of Bayonne that this arm was invented. What led to the invention of it was, that in a fierce combat between some Basque peasants and some Spanish smugglers, the former having exhausted their ammunitlon, and being thereby at a disadvantage, fastened their long knives to their muskets, and by means of the weapon so formed put their enemies to flight. This arm rapidly came into general use in Europe. After the King's regiment, several others were provided with the bayonet, and the dragoons received it in 1676. In 1678, at the time of the peace of Nimeguen, all the French grenadiers had the bayonet, but the socket, which makes the use of it so easy, was not invented until a later period. An unsuccessful experiment with the socket was made before Louis XIV., in 1688, but the want of uniformity in the muskets was then an obstacle to the adoption of this simple and efficacious piece of mechanism. Bayonets at that time were a sort of dagger, of which the handle was placed in the muzzle of the musket, and of course prevented the musket from being fired. The first battle at which the bayonet was seriously employed was that of Turin in 1692; but it was not until the battle of Spires in 1703 that the first charge of the bayonet was executed. After that epoch up to 1792, the bayonet was often employed in combat, and the Prince de Ligne called it a "peculiarly French arm," owing to the manner in which our soldiers used it; but the real value of it was not revealed until the wars of national independence. Then the bayonet really became a French arm. "The bullet is wild," said Suwaroff, "but the bayonet is prudent and sure."—*Moniteur.*

TRAVELING IN A CIRCLE.

MESSRS. EDITORS:—I observed in a recent number of the SCIENTIFIC AMERICAN an article properly ridiculing an absurd theory, proposed by a correspondent of the *New York Daily Times*, of the reason why lost persons travel in a circle; and having previously seen several entirely unsatisfactory theories and never a correct one, permit me to state the reason as it has appeared to my mind from personal experience.

All who are lost do not travel in a circle; but some bewildered persons do so, and the circular movement results from an erroneous idea becoming fixed upon the mind of the lost traveler that he is deviating either to the right or left from his true course. This notion causes apprehension, dwells continually upon the thoughts and influences every step of the so-bewildered person; and the attempt to correct the supposed deviation, constantly and regularly made, causes the lost person to walk in a circular path. A. W.

New York City, May 27, 1859.

Another correspondent, referring to the same subject, writes as follows:—

MESSRS. EDITORS:—Permit me to present a plausible reason why a lost person always travels in a circle (if such is really the fact). I presume, having lost the rudder of purpose or of will, he is thrown back on physical power; and as electricity is a great motive power, moves in circles, acts on man through his muscles, and as the muscles of one side of a man are larger and stronger than those of the other side, therefore the strong muscle side is kept next the current, and the body is thus caused to move in the electric circle. W. F. G.

Portland, Conn., June 4, 1859.

[It is related that when the Royal Society was first established in London, Charles II., who was a bit of a wag, gave its members the following very important subject for scientific discussion:—"Why is it that, when a fish is placed within a basin-full of water, it does not make the basin run over?" Night after night the sages discussed the question to the great amusement of the Merry Monarch. At last, Sir Christopher Wren ventured to ask him if he was perfectly sure no water would be forced over the edge of the basin when the fish was placed in it. With a sly twinkle of his eye, Charles answered, "Ah, Sir Christopher, that I do not know; but I would advise the gentlemen of the Society always to be sure that such and such is the case before they proceed to account for the cause." Such advice we would give to all those who are engaged in fathoming this deep question.—EDS.

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PALACES OF THE PEOPLE.

THE FIFTH AVENUE HOTEL.

Few, if any, of the retired and peaceful inhabitants of the rural districts, who have passed the whole or the greater part of their lifetime on quiet farms, in cozy cottages, secluded villas, or hunters' isolated huts, can have even the faintest idea of the immense size and splendor of the hotels which are frequently being built in New York and other large cities of this country. A description in full detail, now and then, of the exterior and interior features of any one of these "palaces of the people" cannot fail to interest and instruct the readers of the Sci- accounts indicate the pro- building arts in America, as improvements successively made in the construction and general arrangement of hotels—a class of structures of which the United States is justly proud, because of their universally acknowledged pre-eminence in point of convenience and luxury over all European edifices devoted to the same purpose.

For several months past, the astonishment and admiration of both strangers and our own citizens, when promenading the most fashionable locality in New York, has been elicited by the gradual growth of a mammoth marble building in course of erection in the Fifth-avenue, opposite Madison-square. When completed this building will be the most magnificent of all the great first-class hotels ever erected in this country, and it will be capable of accomodating at least 800 guests.

The *N. Y. Journal of Commerce*, in referring to this subject, says that this structure covers full sixteen lots of ground, is seven stories high, and has an elevation from the cellar to the roof of 107 feet. The front on Fifth-avenue and Broadway is 202 feet; on Twenty-third-street, 215 and on Twenty-fourth-street, 196. The main entrance is on the Fifth-avenue. On the right of this is the grand stairway, opening from the hall, and on the left is the business-office. In the rear of the main floor, is situated the billiard and chess rooms on one side, and the gentlemens' exchange and reading-room on the other. There will also be attached to the house a Parisian restaurant, not only for the guests, but as a place where other gentlemen and ladies may dine with their families or friends, genteely and economically.

On the second floor, are the public and private parlors, opening into a corridor 613 feet long, running the entire length of the building. At the end of this corridor is the grand promenade, nearly 30 feet wide, uniting with the grand dining-hall at its western extremity, and presenting, with its double rows of columns, a magnificent *tout ensemble*. The grand-dining hall is 80 feet long, 60 feet wide and 21 feet high, lighted with elegant chandeliers hung from a frescoed ceiling supported by Corinthian columns. Between the latter, on one side, are placed magnificent mirrors; while between the same, on the other, are placed beautiful French *buffets*.

The house contains eight large public parlors, 120 private do.; four dining and tea rooms; 420 chambers, and other rooms for servants, &c. Nearly all of the principal chambers have baths and water arrangements complete, there being fully 100 baths in all.

To facilitate communication between the several stories, there is provided a luxurious car or ladies' carriage, which is capable of seating ten persons and is caused to glide from the lowest floor to the uppermost story; this car is propelled by steam power, passes up a revolving spiral shaft near 100 feet in hight and ten inches in diameter, and is provided with a most efficient hydraulic device for ensuring the safety of the persons within it, in case of the breaking of any of the hoisting tackle.

The whole building will be supplied with an independent gas apparatus, costing about $6,000,—by which the expense of illumination, as already proved in actual service, is reduced one half in comparison with city charges. The gasometer for the Fifth-avenue Hotel holds 63,000 cubic feet and will supply 3,000 burners. Iron tanks are used, instead of the ordinary cisterns.

The plan of ventilation is very effectual, the heat of the furnaces being conducted into flues, extending over the house, thereby creating a strong draft and exhausting the atmospheric impurities of the various apartments.

The building is heated by steam, for which three boilers, each 22 feet in length and nearly five feet in diameter, are provided. From these, the steam is conducted by pipes all over the building, the condensed steam being carried back to the boilers by a return flue. The boilers and gas-house occupy a distinct building, wholly detached from the main structure.

Among other novel and curious kitchen apparatus are ten monstrous steam kettles, each weighing nearly 1,000 pounds, for boiling vegetables, &c. All the various machinery for cooking, washing, ironing, and other processes, is in a building specially constructed, and of sufficient capacity to supply the wants of 1,000 guests.

The entire cost of this establishment, will exceed one million dollars, as shown by the following items:—

Building, exclusive of front	$400,000
Marble front	50,000
Ground, sixteen lots	350,000
Steam, plumbing and gas fixtures	55,000
Mirror plates and frames	30,000
China, glass, plate, &c	30,000
Chandeliers	15,000
Laundry and cooking apparatus	8,000
Gas works	6,000
Cabinet furniture and upholstery	200,000
Total	$1,144,000

The hotel and grounds belong to Amos R. Eno, Esq., who has leased it for a term of years to Paran Stevens, Esq., proprietor of the Tremont and Revere Houses, of Boston, Mass.

SUGAR-MAKING IN CUBA.

To begin at the beginning. The cane is cut from the fields by men and women working together, who use an instrument called a machete, which is something between a sword and a cleaver. Two blows with this slash off the long leaves, and a third blow cuts off the stalk near to the ground. At this work the laborers move like reapers, in even line, at stated distances. Before them is a field of dense, high-waving cane, and behind them, strewn wrecks of stalks and leaves.

Ox-carts pass over the field, and are loaded with the cane, which they carry to the mill. The oxen are worked in the Spanish fashion, the yoke being strapped upon the head close to the horns, instead of being hung round the neck, as with us, and are guided by goads and by a rope attached to a ring through the nostrils. At the mill the cane is tipped from the carts into large piles by the side of the platform. From these piles it is placed carefully, by hand, lengthwise in a long trough. This trough is made of slats, and moved by the power of the endless chain connected with the engine. In this trough it is carried between heavy, horizontal, cylindrical rollers, where it is crushed, its juice falling into receivers below, and the crushed cane passing off and falling into a pile on the otherside.

This crushed cane—bagazo—falling from between the rollers, is gathered into baskets by men and women, who carry it on their heads into the fields and spread it for drying. There it is watched and tended as carefully as new-mown grass in haymaking, and raked into cocks or winrows on an alarm of rain. When dry, it is placed under sheds for protection against wet. From the sheds and from the fields, it is loaded into carts and drawn to the furnace doors, into which it is thrown by negroes, who crowd it in by the armful, and rake it about with long poles. Here it feeds the perpetual fires by which the steam is made, the machinery moved, and the cane juice boiled. The care of the bagazo is an important part of the system; for if that becomes wet and fails, the fires must stop or resort be had to wood, which is scarce and expensive.

Thus, on the one side of the rollers is the ceaseless current of fresh, full, juicy cane-stalks, just cut from the open fields; and on the other side, is the crushed, mangled, juiceless mass, drifting out at the draught, and fit only to be cast into the oven and burned. This is the way of the world, as it is the course of art. The cane is made to destroy itself. The ruined and corrupted furnish the fuel and fan the flame that lures on and draws in and crushes the fresh and wholesome; and the operation seems about as mechanical and unceasing in the one case as in the other.

From the rollers, the juice falls below into a large receiver, from which it flows into great, open vats, called defecators. These defecators are heated by the exhaust steam of the engine, led through them in pipes. All the steam condensed forms water, which is returned warm into the boiler of the engine. In the defecators, as their name denotes, the scum of the juice is purged off, so far as heat alone will do it. From the last defecator, the juice is passed through a trough into the first caldron. Of the caldrons, there is a series, or, as they call it, a train, through all which the juice must go. Each caldron is a large, deep, copper vat, heated very hot, in which the juice seethes and boils, At each, stands a strong negro, with long, heavy skimmer in hand, stirring the juice and skimming off the surface. This scum is collected and given to the hogs, or thrown upon the muck heap, and i said to be very fructifying. The juice is ladled from one caldron to the next as fast as the office of each is finished. From the last caldron, where its complete crytallization is effected, it is transferred to coolers, which are large, shallow pans. When fully cooled, it looks like brown sugar and molasses mixed. It is then shoveled from the coolers into hogsheads. These hogsheads have holes bored in their bottoms, and, to facilitate the drainage, strips of cane are placed in the hogsheads, with their ends in the holes, and the hogshead is filled. The hogsheads are set on open frames, under which are copper receivers, on an inclined plane, to catch and carry off the drippings from the hogshead. These drippings are molasses, which is collected and put into tight casks. I believe I have, thus given, the entire process.—*Dana's Trip to Cuba.*

THE OIL OF PEPPERMINT.

There are several plants which yield fragrant oils when distilled with steam. Among this class peppermint holds a high place on account of its exhilarating as well as its aromatic qualities. About three thousand acres of it are under cultivation in this country, viz., 1,000 in New York and Ohio, and 2,000 in St. Joseph's County, Michigan, which appears to be its headquarters. It is raised exclusively for its oil, about 7 lbs. of which is the average yield for an acre of plant, the price being $2 50 per lb. The roots of the peppermint are planted thickly in rows, between which spaces are left for the cultivator to pass. The plant is generally cut about the latter part of August, and placed in small cocks like those of hay, which are allowed to stand in the fields some days before being taken in for distillation. Great care is exercised to prevent weeds growing among the plants so as to ensure a pure article of oil. The fields are plowed up and changed every five years; the first year's crop being generally the most abundant and the purest.

The apparatus for distilling peppermint oil consists of a boiler for raising steam, a still made of wood for receiving the charge of peppermint, a cooler for condensing the oil and a receiver into which it flows. The whole apparatus is exceedingly simple. The plants are packed into the wooden still and trampled down with the feet; when a full charge is thus ready, the lid of the still is put on and steam admitted at the bottom by a pipe from the boiler. When the peppermint is heated to about 212° Fah., its essential oil passes over with the steam into a worm which is placed in a cooler; and as it condenses into oil and water, it then passes out of the worm into a connected receiver, where the oil, as it floats on the surface, is lifted out with dippers, placed in tin cans and is ready for sale.

The refuse mint taken from the still is placed in piles, dried, and then becomes tolerable fodder for sheep. About 12,000 lbs. of peppermint oil are shipped to England per annum, and the profits are about 18 per cent upon the capital invested and the labor required to carry on the entire business.

At the great French Exhibition of Industry held in Paris in 1855, samples of the oil of peppermint made in this country were exhibited, and were considered the best on exhibition.

OHIO MECHANICS' FAIR.—We have received a circular announcing the rules and regulations of the Seventeenth Exhibition of the Ohio Mechanics' Institute, which opens at Cincinnati on the 1st of September next, continuing twenty-one days. The previous exhibitions held under the care of this Institute have been alike creditable to it and also to the great industrial interests of the Ohio valley; and we hope this year to see an exhibition far superior to anything of the kind yet held in a western city. It is our intention to visit the approaching Fair at Cincinnati, and we hope to find a display of the mechanical and manufacturing arts well worthy of careful study and extended review.

Any person who may wish to consult the rules and regulations which are to govern this exhibition may do so by calling at our office.

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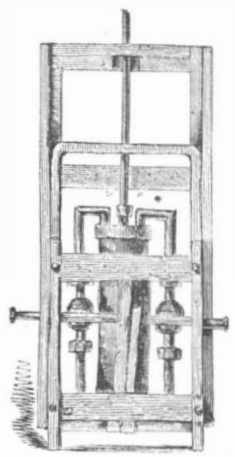
INTERESTING REMINISCENCES OF AN EARLY EXPERIMENT IN STEAM NAVIGATION.

MESSRS. EDITORS:—Upon the reception of your letter sometime since requesting a photograph and particulars of Mr. Edward West's "venerable engine," I determined to obtain as full an account of the first working of that little model engine as was possible, and hence I addressed notes and verbal requests to various friends who were present and witnessed the experiments. Mr. West was a neighbor of mine, or rather of my father; but his death occurred at a period sufficiently recent to enable me to have him for a personal acquaintance, and to visit him in his working office. His youngest son was my schoolmate.

Edward West was a Virginian, who moved to Lexington, Ky., in 1785 or 1786. He was a maker of watches, clocks, guns, &c., and a general repairer of injured articles. He was ingenious and industrious, and his talents seem to have descended as an heirloom to his children and grand-children. Of the former he had several, among whom was the late William West, portrait-painter (I think for a while a resident of your city), to whom Lord Byron sat for his portrait. Another son, Mr. John B. West, of Nashville, seems to have inherited that peculiar taste for mechanics which so distinguished his father.

Many truthful and excellent citizens testify that Mr. Edward West spent all his leisure time in experimenting with steam and steam machinery of his own construction; and that, for several years before a public trial, he was engaged at occasional times in perfecting that little model which I have now in my possession, and a stereoscopic photograph of which I now enclose to you. It is believed



that this little engine was among the first, if not the very first, which ever propelled a boat on the waters of the United States by the use of steam as a motive power. This honor Mr. West's friends seem determined to accord to him, although Fitch is said to have made the initiatory step in 1787. There is a discrepancy in the dates of several living witnesses as to the exact year when Mr. West made his public trial of the little engine. His son (John B.), having access to his father's papers, says it was in 1793 or 1794. Dr. B. W. Dudley, in a note to me (May 30, 1859), says: "I have received your note inquiring the time when Mr. West made his experiments upon steam navigation in Lexington; it was upwards of sixty years ago." Dr. Dudley then refers me to others, and particularly to John B. West. Mr. F. Dewees and Mr. Jos. Lanckart (both of whom witnessed the experiment when boys) think it occurred between 1800 and 1804. One eye-witness says he thinks it was in 1802, whilst another informs me that his impressions carry him back to 1798. I can only reconcile these discrepancies upon the supposition that Mr. West made frequent trials whenever any new idea or improvement suggested itself. On April 22, 1816, the following editorial notice appeared in the *Kentucky Gazette*, the oldest newspaper published in Lexington:—

"STEAMBOATS.—A steamboat, owned by a company of gentlemen of this town, was to sail for New Orleans yesterday, from near the mouth of Hickman Creek. We are informed that she is worked on a plan invented by Mr. West, of this place, nearly twenty years ago, and in a manner distinct from any other steamboat now in use. On trial against the current of the Kentucky, when that river was very high, she more than answered the sanguine expectations of her owners, and left no doubt on their minds that she could stem the currrent of the Mississippi with rapidity and ease."

This notice settles, apparently, two points—first that Mr. West made or invented his engine in 1796; and second, that as recent as 1816, her builders preferred Mr. West's plans to all others.

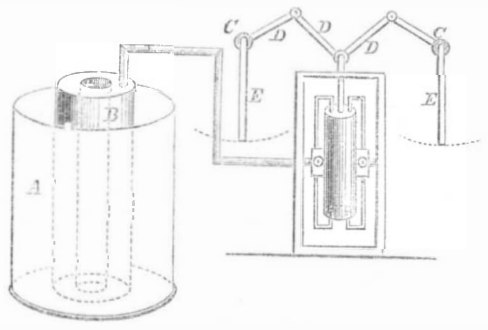
You are at liberty to publish as much of this communication and of the enclosed letter and diagram furnished by Mr. John B. West, as may be deemed useful information in the history of steam in the United States.

Very respectfully,

SAMUEL D. MCCULLOUGH.

Lexington, Ky., June 27, 1859.

[We have no doubt our readers will peruse the above details with much interest; and we thank our good friend, McCullough, for his kind attention to our request for the information now published. It is not the first time we have felt ourselves indebted to him for favors. He also encloses us a sketch and description of the engine above alluded to, furnished by one of the inventor's sons, Mr. John B. West, who writes:—



"The above is a sectional view of the engine, boiler, furnace and working arms of Edward West's steamboat, as used in his experiments about the year 1793 or 1794.

A represents the open top furnace made of sheet iron; and B the boiler, with open cylinder through the center. C C are ends of shafts, extending across the boat. D D D D are jointed arms connected with the piston rod and with the shafts, C C, midway of their length. E E are arms connected with the ends of shafts, C C, extending down outside of the boat, to which arms are attached the frames in which the paddles are fixed in a perpendicular position; the paddles being operated in a curve through the water coming up between two beams and running back upon those beams to a dropping-through place; the paddle frames were suspended by chains, &c.

The above drawing and description extends nearly as far as my recollection goes. I was a small boy at the time of the public trial. For several years previous my father had been experimenting to accomplish his object. He obtained a patent for this invention and deposited a model in the United States Patent Office; he also had several other patented inventions, among the more ingenious of which I may mention a machine for cutting nails and an improvement in gun-locks; but the models of all his inventions were burned by the British in our last war with England.

I do not know the birthplace of my father; but my grandfather was an Englishman and his wife a Welch-woman. About the year 1785 or 1786 my father came from Falmouth, Va., to this place. He was 70 years old when he died. Mr. David A. Sayers administered on his estate, but I know not what became of his papers."

IMPROVEMENT IN FRICTION MATCHES.—The common friction matches are not water-proof, and are often so affected by even the moisture in the atmosphere that no light can be obtained from them. It is not the sulphur which is thus sensitive to humidity, but the phosphoric composition, and it would be a great boon if all the matches manufactured were water-proof. By the invention of Levi J. Henry, of New York, this can be done without in any way increasing the cost. Instead of dipping them first in sulphur and then in the phosphoric composition, he dips them in the composition first, and then in the sulphur, by which method the phosphorus has a water-proof covering, which breaks off at the first attrition, leaving the phosphorus bare to be ignited. For better matches he uses resin, or shell lac, or some similar composition; but the simple change in the mode of dipping is the one which will, in our opinion, come into general use. The inventor has assigned his patent to Daniel Benrimo, of New York. The patent is dated April 5th, 1859.

SELF-MADE MEN.

We copy the following from the *Conservatory Journal*—a paper published in Boston, Mass., by W. E. Baker, No. 16 Summer-street. It is devoted to the establishment of a conservatory of art, science and historical reliques in the Bay State, and contains the proceedings of the scientific societies; many original articles and a variety of items of interest that cannot fail to instruct, while they delight the reader. Its object is a laudable one, so good, indeed, that we wish it every success. The price is only $1 per annum, and it is published weekly,

Biography has no greater end than to record the lives of those, who, beginning their careers in an obscure and humble position, have [redacted] and eminence; and to present [redacted] miring posterity, the bright examples [redacted] made," whose only passport to fame was their individual energy, industry, integrity, and application. Biographical literature abounds with these instances. The catalogue of popes, emperors, statesmen, soldiers, scholars, men of science, the literati, and merchants, will each contribute its quota of the names of those talented and persevering men who have shed a luster on their respected orders. To select a few at hazard:—Pope Sextus VI. was a swineherd. Cardinal Wolsey, for some time prime minister of England during the reign of Henry VIII. sprang from obscurity. The Emperor Napoleon I, was only a lieutenant of artillery when Louis XVI. of France terminated his existence on the gory scaffold of the Place de Greve. Lord Clive, Governor-general of India, and conqueror of the Great Mogul, commenced his career as a writer in the East India Company's Service. La Place was the son of a Normandy farmer. Most of Napoleon's most celebrated marshals, Murat, King of Naples, Ney, Junot, Bernadotte, and others, rose from the ranks. James Cook, the renowned circumnavigator, was a laborer's son. Gifford, the essayist and reviewer, and the poet Bloomfield were shoe-makers. Lord Campbell, lord chief justice of England, was a parliamentary reporter, and was for some time employed on the *Morning Chronicle*, a London daily paper; as also was Charles Dickens, formerly a lawyer's clerk. George Stephenson, the engineer, worked in a coal-pit when a boy. Faraday, one of the brightest luminaries of science, was a book-binder's assistant. Hugh Miller, the geologist and editor, whose posthumus works have recently been published in this country was a stone-mason. Burns followed the plow. Elihu Burritt was a blacksmith. But we need not stretch our eyes across the Atlantic for instances of self-culture and advancement. America has, both in public and private life, a long array of names from which we can cull some of the greatest and most valuable examples on record, and in which distinction has been one, or fortunes amassed, in defiance of every difficulty, and in the face of every obstacle. Roger Sherman, Franklin, Washington, Astor, Rittenhouse, Cary, Haines, King the traveler, Bowditch, Smith, Whitney, Benjamin West, and many others may be cited for universal encouragement and imitation.

FIRE GRATES AND CHIMNEYS.—A commission, appointed by the Board of Health in England, consisting of Mr. Fairbairn and Professors Wheatstone and Playfair, have made a report on grates and fire-places, in which they recommend some changes. They urge for all parlor grates the use of a greater amount of reflecting surface, to direct more heat into the room, and they advise the flue of the chimney to be much smaller than those in common use—a reform which we have also frequently advocated. They state that the flue of a chimney does not require to be made more than 9 inches in diameter at its widest part; a narrow chimney diminishes the quantity of ascending air and a tendency to smoke. Chimneys always draw better when they are kept warm; therefore, wherever it is possible, they should not be built on the outer walls of houses, such as gables. As a general rule the grate should be situated at such a position in the fire-place where it can be seen from the greatest number of points in the room, and a good frontage of fire-surface should always be exposed.

WINANS' STEAMER.—We regret to learn that this novel experimental steamer was sunk a few days since, at the wharf in Baltimore, in consequence of the carelessness of a workman in neglecting to close a supply pipe. She has since been raised, with but little damage.

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UTILIZING SMALL THINGS.

A correspondent of the Philadelphia *North American Gazette* alludes to the saving of what is called "waste" at the Altoona machine-shops of the Pennsylvania Railroad as follows:—"Waste is cotton shreds and rags used for cleaning locomotives and other machinery. It soon becomes saturated with oil and dirt, and in that condition is useless. This article, seeming like a small item, adds, nevertheless, some eight thousand dollars to the expense account of the road. Some ingenious Yankee proposed washing this waste by steam, using soda or some other cleansing compound, afterwards drying it in a centrifugal drying machine. It was tried and proved that, by renewing, this item of expense can be reducing at least one-half. The degree of attention paid to these minutiæ in detail, will, at any time, upon so extensive an undertaking, make the difference between a dividend or non-dividend-paying road."

It is surprising to what an extent seemingly useless articles are utilized in the manufacturing arts. We will present a few examples to illustrate this point:—

The prussiate of potash is made in large quantities in Cincinnati, from hoofs, horns and other refuse of slaughtered grunters.

Cow hair taken from the hides in tanneries is employed for making plastering mortar to give it a sort of fibrous quality.

Saw-dust is daily sold in our streets for sprinkling the floors of markets; it is also used for packing ice for shipment.

The rags of worn-out shirting, calico dresses, and the waste of cotton factories are employed to make the paper upon which these lines are printed.

Old ropes are converted into fine note paper, and the waste paper itself which is picked up in the gutters of our streets is again re-converted into broad, white sheets, and thus does duty in revolving stages.

The parings of skins and hides and the ears of cows, calves and sheep are carefully collected and converted into Peter Cooper's famous glue made out at "Old Bushwick."

The finer qualities of gelatine are made from ivory raspings—the bones and tendons of animals.

Bones converted into charcoal by roasting in retorts are afterwards employed for purifying the white sugar with which we sweeten our coffee, &c.

The ammonia obtained from the distillation of coal, in making gas, is employed for saturating orchil and cudbear in making the beautiful lilac colors that are dyed on silk and fine woolen goods.

Carbolic acid obtained in the distillation of coal-tar is employed, with other acids, to produce beautiful yellow colors on silk and wool.

The shavings of cedar wood used in making pencils are distilled to obtain the otto of cedar wood.

Brass filings and old brass kettles are re-melted and employed to make the brass work of printing-presses and pumps.

Old copper scraps are used in the construction of splendid bronze chandeliers for illuminating our churches and the mansions of the wealthy.

Old horse-shoe nails are employed to make the famous steel and twist barrels of fowling-pieces.

Coal tar is burned and made into lampblack, used for printers' ink, common black paint and blacking for shoes, &c.

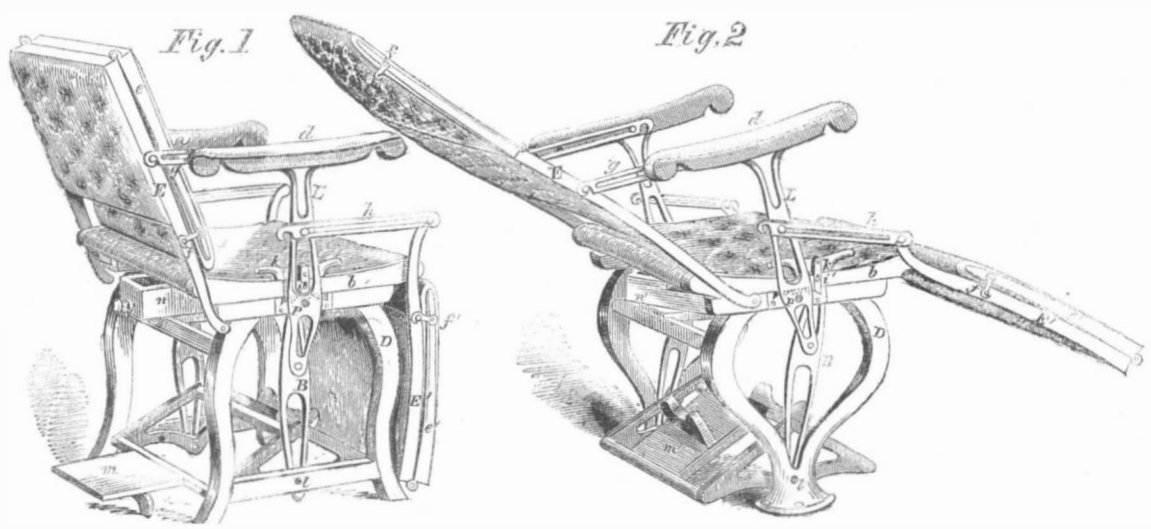
The cast-off gauze dresses of Parisian *belles* are purchased for a mere song and sent to the West India Islands, where they perform a second duty in decorating the sable daughters of the tropics.

Oyster shells are burned in kilns and afterwards used in making cements, their base being pure lime.

NEW RAILROAD CAR SEAT.

The car seat, illustrated on the succeeding page, is capable of being fitted in any car, that is an admirable day seat as well as a sleeping couch, and that gives the passengers an amount of comfort in railway traveling which they never before enjoyed. The principle on which it is constructed is, having the seat and back secured to the frame, D, by means of an oscillating bar, B, to which also the arms, L, are pivoted, being connected to the frame by a pivot, P. Fig. 1 shows the invention arranged for a day seat, and Fig. 2 for a reclining chair or couch. The seat, *b*, slides back and forth on the top of the frame, D, that has a double rack with angular teeth in it, into which a stop, *i*, fits and holds the seat in the proper position on the frame. The stop, *i*, can be lifted from either side of the handle, *k*. To each end of the seat an extension, E and E', is pivoted, and these extensions have supplemental pieces, *e e'*, hinged to them, so that they can either be extended as in Fig. 2, or folded up as in Fig. 1, and secured by the hook or catch *f*. On the inside of the rail, *d*, of the arm, L, is a headed pin, on the neck of which works a slotted piece, *g*, that is hooked at each end, so that it can connect with either E or E', which ever happens to form the back at the time; and on the outside of L are similar pins and slotted pieces, *h*, that hook on the end of projections that terminate the part which constitutes the foot rest at the time, as E'. The seat, *b*, is connected to B, that is pivoted to the frame at *l*. An oscillating foot-rest, *m*, is added for comfort's sake, which rest can be placed in either of the positions indicated by *m* and *m'*. And to promote cleanliness, a spring spittoon box, *n*, is added under the seat, so that gentlemen may expectorate without annoying their neighbors or soiling ladies' dresses. For the occupant to place him or herself in any position, or at any angle, the only thing to be done is to elevate the catcher, *i*, by the handle, *k*, and when in the proper position, the catch being released, it drops into a recess of the rack and holds the chair rigidly comfortable. To raise the body the feet must be lightly pressed against the leg-rest and the body leaned slightly forward, and the occupant is in the perpendicular, almost before he is aware of the fact. Of course, the seat is reversible by unhooking *g* and *h* on one side and hooking them on the other. The same principle is admirably adapted for invalid and reclining, dental or surgical chairs, and even a comfortable library chair made in this fashion would give additional zest to a book. A safe cot can be made of it for holding a baby, out of which it would be impossible for the child to fall; and altogether, for comfort, ease of construction and simplicity, it approaches nearer the requirements we mentioned when we first called inventors' attention to this subject on page 325, Vol. XIII., of the SCIENTIFIC AMERICAN, than any other we have seen, and it is only that we have before our eyes the awful fear of tiring the reader, or we should expatiate at greater length on its numerous merits.

The inventor is J. M. Baird, of Wheeling, Va., who has assigned half the patent to Levi F. Smith, of North Stonington, Conn., and either of them will be happy to give any further information concerning it. Mr. Smith may also be addressed at No. 109 Wall-street, New York. The patent is dated Aug. 17, 1858.



BAIRD'S CAR SEAT AND RECLINING CHAIR.

COALS AND FURNACES—BURNING SMOKE.

It has long been a most desirable object in burning bituminous coals to consume all the smoke, and in England a law has been passed for the purpose of compelling all the owners of factories to use furnaces for the prevention of this smoke evil. In 1855 a prize of £500 ($2,500) was offered by the Colliers' Association of Newcastle, and was contended for in December 1857, for the best method of burning bituminous coals in furnaces of multitubular boilers without smoke. On that occasion the prize was awarded to C. W. Williams, of Liverpool, he having produced the best furnace and system of feeding the fuel to it. The report of the judges on the trials has but recently been published, and from it we obtain information which is of the utmost importance to our Pittsburgh and Cincinnati manufacturers, and all the engineers on the Ohio and Mississippi rivers, who use bituminous coal for fuel.

It has been demonstrated to the satisfaction of the most able engineers on the other side of the Atlantic, that bituminous coals can be burned in furnaces without producing smoke; and this by a very simple construction and arrangement of the furnace doors, and the method of feeding the coal. The whole system consists in having the furnace doors made with double plates, the inside one situated a few inches apart from the outside, so as to form a small chamber between them. The front and back plates are perforated with holes or slits, and the air is heated as it passes through into the fire. The small holes deliver the air to the fuel in minute currents, and the fresh coals are fed to the fire, by being laid right behind the door, the red coals being pushed forward every time the fresh are fed in. This arrangement of furnace-doors, and the method of feeding, entirely prevents smoke upon well-known principles. When fresh bituminous coal, is thrown upon a red hot fire, the more volatile part passes off as smoke; were this supplied with fresh air and made to pass over a red-hot fire, it would ignite and be consumed. The air which passes through the holes in the furnace-door, mixes with the volatile products of the fresh coal, and these are ignited as they flow over the red fire on their way to the flue tubes. Of course, air is also admitted in the usual manner under the furnace bars, which should be half an inch thick at the top and very thin at the bottom, and an air-space of $\frac{3}{8}$ of an inch left between them; such furnaces are made a little longer in front than the common kind: no other alteration is necessary, excepting perforating the door.

With furnaces so constructed, one foot of grate surface has evaporated four cubic feet of water per hour, from 60° Fahrenheit, which is double the amount usually obtained; and the economy of fuel has been over 25 per cent. With such furnaces 11.30 lbs. of water have been evaporated with one pound of coal, and owing to the fresh coal being always placed close to the door, the heat in the fire-room is but low, while the doors are kept cool and thus they last much longer. In employing bituminous coal in a multitubular boiler, the whole fuel should be perfectly burned in the furnace, the flame running the whole length of the fire; as the inflamed gases, if just ignited near the mouth of the tubes, are very liable to be extinguished when they enter them, and thus great loss of heat is sustained. These statements deserve the serious attention of those to whom we have made reference. If attended to and acted upon, we believe they will be the means of saving more than a million of dollars in fuel, during the present year, in the valley of the Mississippi. Furnaces in which anthracite coal is burned do not require such arrangements, because no volatile combustible matter is given off from this fuel.

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THE HEROES OF INDUSTRY.

BY G. P. R.

Let others write of those who fought
On many a bloody field—
Of those, whose daring deeds were wrought
With sword, and spear, and shield;
But I will write of heroes bold,
The bravest of the brave,
Who fought for neither fame nor gold—
Who fill an unmarked grave!

Heroes who conquered many a field
Of hard and sterile soil—
Who made the sturdy forest yield
To unremitting toil;
Heroes who did not idly stand,
But dealt such fearful blows
That acres, broad, of worthless land
Now blossom like the rose.

The heroes of the plow and loom,
The anvil and the forge;
The delvers down amid the gloom
Of yonder rocky gorge:
Heroes who built yon lofty tower,
And forged its heavy bell,
Which faithfully proclaims the hour,
And marks its flight so well.

Heroes who brought from every clime
Rich argosies of wealth;
Heroes of thoughts and deeds sublime,
Who spurned what came by stealth;
Who won a guerdon fair and bright,
And left no bloody stain—
No hearth profaned—no deadly blight—
Upon God's wide domain.

These world-wide common workers crave
No laurel wreath of fame—
No monument above their grave;
They toiled but for A NAME
Among the lowly ones who plod
Their weary way along,
With faith and confidence that God
Correcteth every wrong!

Buffalo, N. Y., June, 1859.

CURIOUS FACTS ABOUT THE COST OF WAR.

When we divest war of the heroic and chivalric associations which unfortunately give it a charm to man, from the romantic element that is a portion of every one's composition, and bring it down to a mere question of profit and loss, expenses and receipts, we shall find that war is a wasteful amusement, and a luxury that should be too dear for the richest nation to indulge in. The cost of the present war, and the *materiel* necessary to carry it on, may be roughly estimated from the details of the supply of men, ammunition, provender, etc., which were sent to the French army in the Crimea. At the present time such calculations are interesting, and we are enabled to give these details, which have been furnished by the Minister of War in France, M. Vaillant.

The whole force sent by France to the Black Sea was 309,268 soldiers and 41,974 horses; of the former 70,000 were killed or died in the hospitals, or were otherwise missing. It is considered that 93,000 were wounded and survived. Of the horses only 9,000 returned to France. The great guns, howitzers, &c., were 644, besides 603 furnished by the navy. The light artillery for field service furnished 500 guns more, and in all there were 4,800 wheel vehicles for cannon sent from France. The missiles of death, too, were fearfully vast; 2,000,000 of shells and cannon balls, 10,000,000 pounds of gunpowder, and 66,000,000 of ball cartridges. One hundred batteries and fifty miles of trench were constructed, besides ten miles of defensive works, and five miles of subterranean galleries in the solid rock.

The food sent from France, besides items of smaller quantities, was 30,000,000 pounds of biscuit; 96,000,000 of flour, equal to 450,000 barrels; 7,000,000 pounds of preserved beef; 14,000,000 pounds of salt beef and lard; 8,000,000 pounds of rice; 4,500,000 pounds of coffee; 6,000,000 pounds of sugar; 10,000 head live cattle; 2,500,000 gallons of wine, and nearly 1,000,000 pounds of Chollet's preserved vegetables were among the larger items of supplies. The horse feed, too, was immense: 170,000,000 pounds (equal to 85,000 tuns) of hay; 180,000,000 pounds (90,000 tuns) of oats and barley; 20,000 tuns coal, charcoal and coke. There were 150 ovens to bake bread, and 140 presses to press hay. The clothing was another branch of large supply, comprising garments in such hundreds of thousands that it would be tedious to enumerate them; but as some clue to the matter, the number ranged from 250,000 to 350,000 of each article of clothing. For the piercing cold of the Crimea there were 15,000 sheepskin paletots, 250,000 sheepskin gaiters, and tents for 250,000 men. The harness and farriery departments present an immense quantity of supplies; among them were 80,000 horse-shoes, and 6,000,000 horse-shoe nails.

In nothing do the French so much excel as in hospital arrangements. They sent 27,000 bedsteads for invalids, as many mattresses, and 40,000 coverlets. There was the material for ambulances for 24,000 sick men, and 600 cases of instruments, and 700,000 pounds (350 tuns) of lint, bandages and dressings of various kinds. Then for the sick there were the most liberal supplies for their sustenance, such as concentrated milk, essence of bouillon, granulated gluten, &c. The money expended at the seat of war was $56,000,000. Marshal Valliant also tells of the vast maritime preparations for conveying the army and its supplies over the sea. Among the vessels employed between France and the Crimea, though not stated in the report, were 40,000 tuns of American shipping, embracing some of the finest and largest clipper vessels, as well as some steamers of the American mercantile marine, and for whose services a liberal compensation was made. Taking the totality of all the voyages made by all the men, horses and materials, there were conveyed by the French government during the two and a half years of the war, 550,000 men, 50,000 horses, and 720,000 tuns of materials.

DODGE'S IMPROVED OPEN FIRE-GRATE.

One of the principal reasons why open fire-grates are not much used in this country, is because so much heat escapes up the chimney that the coals are not half burned, the room is not properly warmed, and consequently the expense is very great. Yet what is there so cheerful-looking as an open fire? The very appearance of it, with its glowing coals, does more to promote sociability, and encourage mirth and good humor on a winter's evening than a hundred stoves. What a blessing, therefore, to find an invention which shall enable an open fire-place to be used by all, to cost no more than a stove, to make little dirt, and diffuse the heat into the room instead of drawing such a draft of cold air through the apartment as causes the backs of those sitting around the fire to be in a cold bath, while the front portion of their bodies are undergoing a small roasting. Such an invention is the subject of our illustration, which shows a front view and a vertical section, and which is the result of the ingenuity of Calvin Dodge, of Pittsburgh, Pa. The patent is dated March 18, 1856. He has added to the ordinary fire-place a bridge, A, which suppresses the draft of cold air through the room, and by its diminished opening causes a great quantity of the smoke and gas to be consumed, producing large bodies of flame, and deflects a great quantity of heat into the room, that warms it thoroughly and prevents the chilled backs that we have alluded to. They are extensively in use, and the one which we have had for some time enables us to speak thus commendatorily of its advantages. The new Fifth-avenue Hotel, described under the head of "Palaces of the People," is fitted throughout with these grates; and any further information can be had by addressing J. B. Ryan & Co., Cincinnati, Ohio, who are proprietors of the patent; and we may as well mention that old grates can be reset upon this plan.

CURING GREEN CORN.—The following is the Indian method by which they treat green corn for making succotash, &c. during winter. When the green corn is fit for use, a pit is dug from two to three feet in diameter at top, and gradually enlarging it at bottom, say five feet down, from six to eight feet in diameter. A large fire is then built near by, on which stones are heated, and when red-hot the stones and live coals are shoveled into the bottom of the pit, and sprinkled over with fine loose dirt. The corn is then thrown in with the husks on, just as it is pulled from the stalk, until the pit is nearly full. Then comes a thin layer of loose dirt, then hot stones (enough to close the pit), and the whole covered with earth to retain the heat. When the whole cools off (which takes several days), the pit is opened and the corn is found to be most delightfully cooked. When cool, the husks are stripped off and the corn dried in the sun; when thoroughly dried the corn is shelled off easily, and is then packed away in bags for use.

HOOKS AND EYES FOR LADIES' DRESSES.

The common metallic hooks and eyes which are used so extensively for fastening ladies' dresses, are very defective in an important particular, namely, a liability to become unfastened unless the dress is made to fit very tight. They are therefore not well adapted for loose free dresses—those which are most comfortable and best suited for warm weather. The accompanying illustration, taken from the London *Engineer*, represents an improvement in such articles as will commend itself at once to all who use and all who manufacture hooks and eyes. It is the invention of A. Nichols and F. Walker, the former of Manchester and the latter of Birmingham, England. The improvement consists in forming the common hook with a spring lap, which requires to be slightly pressed down by the finger, as represented, when the eye is placed over the hook.

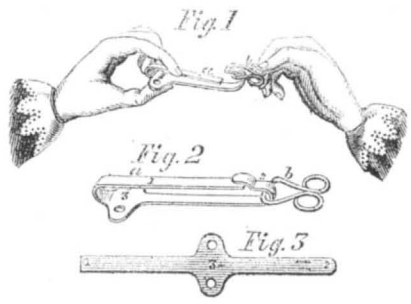

Fig. 1 is a perspective view of the hook and eye when being fastened, the finger being pressed down on the spring lap, *a*, and the eye, *b*, passed over the hook. Fig. 2 shows the eye enclosed in the hook and prevented from becoming unlocked. This improved hook and eye are made of plate metal, and stamped out of a flat blank, as shown in Fig. 3; after which they are turned up and shaped, so that one end shall overlap the other and form an endless link like Fig. 2, which cannot be unfastened by accident or by looseness of dress. In Figs. 1 and 2 the hook is represented as being formed of one piece of metal, the end of the hook being made slightly to overlap the spring hook, *a*. Fig. 3 is the back portion of the blank, 1 being for the lap end and 2 for the hook end, and 3 is the plate intended for the thread holes. The eye, *b*, is the common construction of hook. The ingenious mechanics in Waterbury, Conn., where hooks and eyes, pins, cutlery, and all sorts of tip-top hardware are now manufactured, will at once appreciate this improvement.

GREAT JUMPER.—At a jumping-match which recently took place in Livingston county, N. Y., it is related that one man made a single leap of sixteen feet on the level, a performance, which we think can hardly be beat, as the majority of men cannot leap more than half of this distance; but when we compare man, physically, with some of the very inferior beings of creation, how he shrinks into a narrow compass, especially in the jumping line. There is the *cicada spumaria*, a species of locus, that can leap two hundred and fifty times its length. If a man could leap the same distance in proportion to his size, he would be carried a quarter of a mile; or if he could leap as far as the flea, in proportion to his weight, he might jump half around the globe at one bound.

SCIENCE OF MILKING COWS.—It is a matter of great importance that the milk should all be drawn from the cow's udder. Careful experiments made in England show, according to a report recently published, that "the quantity of cream obtained from the last drawn cup from most cows, exceeds that of the first in a proportion of twelve to one." Thus a person who carelessly leaves but a teacup full of milk undrawn, loses in reality about as much cream as would be afforded by four or six pints at the beginning; and loses, too, that part of the cream which gives the richness and high flavor to the butter.

PERSONS residing in Louisville, Ky., and the vicinity, who wish to subscribe for the SCIENTIFIC AMERICAN, commencing with the new volume, July 2, 1859, can avail themselves of the club rates by leaving their names and money at the office of R. & W Skene & Co., Bullitt-street, in the above city.

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THE RECENT PATENT LAW CASES.

United States Court.
Before Honorable Judge Ingersoll.
CRINOLINE ON TRIAL.

JUNE 17.—*Osborne & Vincent* vs. *Rugg, Berrien & Co.*—This was a suit at law for an alleged infringement of two patents for inventions made by R. J. Mann for Ladies' Extension Skirts, which patents were owned by the plaintiffs. One of the patents covers Extension Skeleton Skirts formed of a series of hoops, each being cut or parted so as to form two or more adjustable ends, so arranged that the diameter of the skirts may be enlarged or diminished, by connecting the ends of the hoops in such a manner that the ends will slide toward and from each other, to enlarge and diminish the diameter of the skirt, in combination with belts and cords crossing the hoops to hold them together, constituting what is known as Ladies' Extension Skeleton Skirts. The other of the patents contains three claims. One of the claims is for the use of metallic slides (on hoops of skirts), bent in opposite directions, the part bent one way being fastened to the hoop, and the part bent the other way forming flanges for the hoop to slide in. The second claim of this patent is for securing the vertical straps or tapes to the hoops, by means of metallic clamps or clasps. And the third claim is for an improvement in a bustle for skirts. Numerous witnesses were examined on both sides, and after the summing up of counsel and the charge of the Judge, the jury found a verdict in favor of the plaintiffs, establishing the validity of both patents.

Geo. Gifford, C. M. Kellar and E. W. Stoughton for plaintiffs; Edward Hoffman for defendants.

THE GREAT INDIA RUBBER CASE TOUGH AND ELASTIC AS EVER.

The Nangatuck India Rubber Company vs. *Chas. Goodyear, Wm. Judson et al.*—In this case a motion was made by the plaintiffs to continue their temporary injunction order, hitherto granted against the defendants, enjoining them from issuing any licenses from selling what is technically known as woven elastic india-rubber goods. C. A. Seward, Esq., opened the case by giving a statement of the contents of the plaintiffs' bill of complaint and affidavits. George Gifford, Esq., made a statement of the nature of the case and of the defense of the defendant Goodyear. The remainder of the afternoon and evening was occupied in reading the affidavits in behalf of the defendant Judson, and argument by the counsel. Decision reserved.

This case, like those of its class generally, promises to stretch itself (or to be stretched out by the lawyers) to as indefinite a length as the material which is the subject of the controversy, though it reminds one of anything else but the poet's line about "linked sweetness long drawn out." There is a formidable array of counsel on both sides, and the motion, like all india-rubber litigations, is sharply contested.

PATENT BONNET ON TRIAL.

Whiten E. Kidd vs. *Jasper Spence et al.*—This was an action for an alleged infringement by the defendants of plaintiff's patent for making ladies' bonnet-frames of two thicknesses of crape lace, dated April 13th, 1858.

Plaintiff contended that the patent embraced the manufacture of crowns as well as of entire bonnet-frames, and consequently that the manufacture of the crowns of the defendants' bonnet-frames was an infringement of the plaintiff's patent; also that a crown was a substantial bonnet-frame, and that a tip was not.

The defendants claimed that the patent was for a mode of manufacturing entire bonnet-frames in the manner described in the patent, and for nothing more or less than this; and, consequently, that the mode of manufacturing bonnet-frames by the defendants was no infringement of the plaintiff's patent; that if the patent embraced the manufacture of anything less than an entire bonnet-frame of crape lace, it embraced the manufacture of any substantial part of a bonnet-frame—as, for example, a tip of crape lace, and was then void, in view of the prior state of the art.

The jury found a verdict for the defendants.

INTERESTING TO PHOTOGRAPHERS.

Tomlinson vs. *Fredericks.*—This was a motion for an injunction brought to restrain the defendant from using a patent issued to James A. Cutting, for sealing ambrotypes with balsam of fir, which was issued July 11, 1854, and assigned to the plaintiff.

The motion being brought on, the defendant read several affidavits to show that the invention was not a novelty, but had been known and used before the issuing of the patent. On hearing these affidavits, the plaintiff concluded to abandon the motion, and an order was thereupon entered denying the same.

A similar motion was brought on at the same time in an action brought between the same parties to recover for the alleged infringement of a patent issued to Cutting on the same date as above for "the employment of bromide of potassium in combination with collodion" in making photographs. The same result was reached in this motion also.

Our cotemporary, the *Tribune*, disposed to be a little facetious over this case, and doubtless with an eye on the allied armies over the water, says, that "each party came to the contest fully armed—the plaintiff supported on his right wing by Mr. Gurney and two assistants from his establishment, and the defendant resting on a strong battery of books. After a short and desperate engagement, the plaintiff was routed, and made a precipitate retreat, leaving his colors, baggage, and ammunition on the field." The plaintiff states that he will soon be heard from again, as he is not satisfied with the result.

MACHINERY FOR ENAMELING.

Robert Marcher vs. *J. J. Sigler.*—This was a motion for an injunction against the defendant for an alleged infringement of the plaintiff's patent for an apparatus for enameling moldings, re-issued March 15, 1859. The claims of this patent will be found on page 235, last volume, SCIENTIFIC AMERICAN. Geo. Gifford appeared in opposition to the motion for the injunction: and after the hearing, it was denied.

A CHAPTER OF CURIOSITIES IN SCIENCE.

The water which drowns us as a fluent stream, can be walked upon as ice. The bullet which, when fired from a musket, carries death, will be harmless if ground to dust before being fired. The crystallized part of the oil of roses, so grateful in it its fragrance—a solid at ordinary temperatures, though readily volatile—is a compound substance, containing exactly the same elements, and in exactly the same proportions, as the gas with which we light our streets. The tea which we daily drink with benefit and pleasure, produces palpitations, nervous tremblings, and even paralysis, if taken to excess; yet the peculiar organic agent called theine, to which tea owes its qualities, may be taken by itself (as theine, not as tea,) without any appreciable effect. The water which will allay our burning thirst, augments it when congealed into snow; so that Captain Ross declared the natives of the Arctic regions preferred enduring the utmost extremity of thirst rather than attempt to remove it by eating snow. But if the snow be melted, it becomes drinkable water. If melted before entering the mouth, it assuages thirst like water; but when melted *in* the mouth, it has the opposite effect. To render this paradox the more striking, we have only to remember that ice, which melts more slowly than snow in the mouth, is very efficient in allaying thirst.

There are many other wonderful paradoxes and curiosities in science; a few more of these we subjoin, in the form of question and answer:—

How much quicker will seeds germinate under a blue glass than when exposed to the full action of light?—Seeds which ordinarily require ten or twelve days for germination, will germinate under a blue glass in two or three.

Why will seeds germinate more readily under a blue glass than in any other condition?—Because the blue glass permits the chemical principle of light to pass freely, and excludes in a degree the heat and light.

Why is it impossible to make seeds germinate under a yellow glass?—Because a yellow glass excludes all the chemical influence of the sun's rays.

How do plants acquire the carbon of which their structure is in a great measure composed?—They obtain it from carbonic acid, which they abstract from the atmosphere under the influence of light.

By whom was the identity of lightning and electricity first established?—By Dr. Franklin, at Philadelphia, in 1752. The manner in which this fact was demonstrated was as follows:—Having made a kite of a large silk handkerchief stretched upon a frame, and placed upon it a pointed iron wire connected with the string, he raised it on the approach of a thunder storm. A key was attached to the lower end of the hempen string holding the kite, and to this one end of a silk ribbon was tied, the other end being fastened to a post; the kite was now insulated, and the experimenter awaited for a considerable time the result with great solicitude; finally, indications of electricity began to appear on the string, and on Franklin presenting his knuckles to the key, he raised an electric spark, the rain beginning to descend wet the string, increased its conducting power, and vivid sparks in great abundance flashed from the key.

Why was the kite insulated when Franklin fastened the key to the post by the silk ribbon?—Because the silk was a non-conductor, and would not allow the electricity received upon the kite to pass off by means of the string to the ground.

Was this experiment one of great danger and risk?—It was, because the whole amount of electricity contained in the thunder cloud was liable to pass from it by means of the string to the earth, notwithstanding the use of the silk insulator.

What happened when the experiment was repeated in France?—Streams of electric fire, nine and ten feet in length and an inch in thickness darted spontaneously with loud reports from the end of the string confining the kite. During the succeeding year, Professor Richman, of St. Petersburg, in making experiments somewhat similar, and having his apparatus entirely insulated, was instantly killed.

Is a building more or less liable to be struck when furnished with a good lightning conductor?—Lightning conductors do not, as many suppose, conduct the lightning towards the building upon which they are placed; they simply direct its course and facilitate the passage of the fluid in the most direct way to the earth, when only a discharge must inevitably occur; there is no attraction, but the lighning takes the road which offers the least resistance.

Are lightning conductors protective when even no visible discharge takes place?—They are. They possess a very great preventive power, and gradually and silently disarm the clouds by drawing the electric fluid from them, and this process commences as soon as the clouds have approached a position vertically over the rod. Professor Faraday recomends the location of lightning conductors inside rather than on the outside of buildings, and says that the lower end should be set into powdered charcoal.

What is the cause of a red sunset?—The vapor of the the air not being actually condensed into clouds, but only on a point of being condensed. In the same manner, if light be transmitted through steam mingled with air, and therefore on the verge of condensation, it assumes a deep orange or red color.

What is the cause of a red sunrise?—The vapor in the upper regions of the air is, just on the point of being condensed.

Why is a red sunset an indication of a fine day tomorrow?—Because, although watery vapor is in the air, it is probably only on the verge of incipient condensation, and not sufficiently so to form rain clouds; and this slowly progressive transition of vast volumes of the air through the temperature of the dew point, can only occur in serene weather at sunset and not at sunrise.

Why is a red and lowering sky at sunrise an indication of a wet day?—The red and lowering appearance of the morning sky, which indicates foul weather, probably indicates such an excess of vapor being present in the whole atmosphere, that clouds are actually forming in the higher regions or upon the point of condensation, which the rising sun cannot disperse.

A WORD TO ADVERTISERS.—As heretofore, we shall devote a limited amount of space to Advertising, and the greatest care will be exercised in regard to the nature and character of the advertising matter. We shall not knowingly admit the advertisement of other than responsible and reliable persons. Instead of 25 cents, our charge in future will be 30 cents per line for each insertion. This, it will be perceived, is not an advance upon our former rates, when the fact is taken into consideration that the *new measure* is somewhat broader than in the last volume. The SCIENTIFIC AMERICAN has long been known to its patrons as the very best medium in the United States for a certain class of advertising. We do not say this to solicit such patronage; we have enough of it already.

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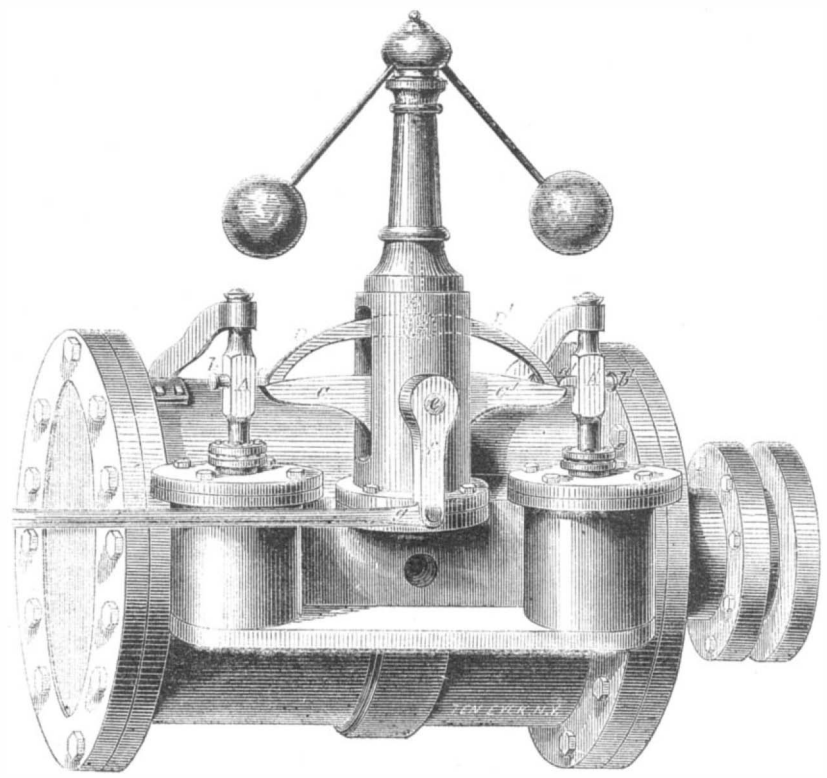
CRUMBIE & BRIGGS' IMPROVED CUT-OFF.

While many inventions seem to be leading to complexity, there is another class whose aim is to simplify and cheapen. The subject of our engraving is one of these, and as its improvement has reference to the working of that greatest of all machines—the steam-engine—it should receive at least a careful investigation and a considerate attention, when its own merits will command adoption. The idea is to obtain a cut-off variable by a governor or other regulating device of simple construction and but few parts, and this has been successfully achieved. The inventors are A. Crumbie and R. D. Briggs, of No. 177 Lewis-street, New York, and they obtained a patent May 3, 1859.

A A' are the stems of the cut-off valves of the ordinary construction and applied to any engine, and through slots in the square head of the stems project small sliding lifters, *a a'*, which are always kept pressed inward by a spring in the hub at their back, *b b'*. C C' is a rocker mounted on a center, *e*, to which an arm, *f*, is attached, and by this and the rod, *g*, C C' is caused to rock by the motion of the eccentric. The upper surface of C C' is slightly curved, and as it rocks, one end moving upwards, it carries the lifter, *a* or *a'*, with it, elevating the valve at the same time, until the arc described by the end of C C', in moving upward, is out of the right line made by *a* or *a'* in moving upward, when *a'* slips off C' or *a* slides off C, and the valve drops. To make this variable, a couple of tripping bars, D D' slide on the upper surface of C C', and they are pivoted by a pivot, *j*, to the end of a sliding bar, E, that is connected by the governor, and is elevated or depressed by it or some other regulating device. As these tripping bars, D D', are forced nearer the ends of C and C', they of course prevent the sliding lifters, *a a'*, from remaining so long on their respective ends, and so cause the steam to be cut off at variable points, regulated by the governor or other device.

This, as will be seen, is remarkably simple and efficient, there being so few parts that there is no liability of their getting out of order, and the wear cannot be other than very trifling.

The inventors will be happy to give any further information on being addressed as above.

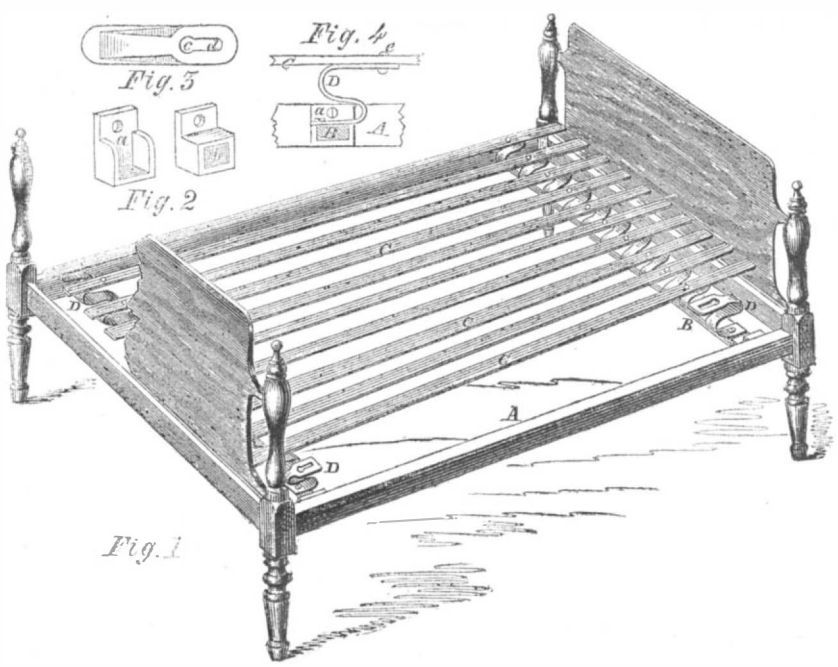


CRUMBIE & BRIGGS' IMPROVED CUT-OFF.

IMPROVED SPRING BED.

"To sleep, perchance to dream," says Hamlet, in his glorious soliloquy. "But why to dream?" asks the reader. Psychologists tell us that sleep is a succession of dreams, and that when our rest is disturbed from physical or mental causes we then remember our dreams, and this popularly is called dreaming, which, in the vernacular, simply means troubled sleep. And this brings us where we ought to have been twelve lines ago, viz., to our subject. We declare that had Hamlet been in the habit of sleeping on the bed, the illustration of which accompanies this article, the world would have been deprived of as fine a bit of poetry as the round English tongue can call its own; because he would have slept so soundly as to never think of dreams, and what would then have become of the soliloquy? He had not the opportunity afforded him, we have; let us avail ourselves thereof.

In Fig. 1, which is a perspective view of the invention, we see a bedstead, A, with the invention applied. On the inner face of the side rails cast-iron stirrups, *a* and *b*, Fig. 2, are screwed, and a rail, B, is placed in them, one at the top and the other at the bottom ends of the bedstead, and by the form of the two stirrups the rails, B, can be readily removed or replaced. The object of this provision is to facilitate the cleaning of the bedstead and aid in keeping out vermin. The slats, C, rest on S-shaped springs, D, secured to B, and whose ends are above the side rails. The springs have an eye hole, *c*, Fig. 3, terminating in a slot, *d*, which receives the the neck of a movable rivet, *e*, placed near the ends of each slat, C. The slats are placed on the springs by inserting the head of *e* in the eye, *c*, Fig. 4, and drawing the neck into the slot, *d;* the rivet on the opposite end is inserted into the eye in the same manner by pressing the spring and allowing it, by its own elasticity, to spring back; this keeps the necks of the rivets in the slats, and the slats securely fixed to the springs. In case the slats, C, should become bent, they can be detached and turned over.



TINKHAM'S SPRING BED.

That this is a cheap and good spring bed can be seen at a glance, and the inventor is L. B. Tinkham, of Lawrence, Mass.; he has assigned half the invention to Charles Ryan, of the same place, and either will be happy to give any further information concerning the invention. The patent is dated April 26, 1859.

ANATOMY OF AN ENGINEER.

The following play upon words is by the inimitable *Punch*:—

The engineer, although he is an *arch* man, yet he is never forgetful of gravity; he is a dab at algebra, for which a Y Z is needful; he is a very Noah at describing arcs. Though he seeketh not after taverns, he is conversant with sines, and payeth due attention to his cosines and sick aunts. Even though not wealthy he helpeth to establish many a bank. He, ever kind and hospitable, supplieth chairs for sleepers; and though addicted to rail, is never forgetful of the tender: he is a dutiful subject, and though often in hot water, ever payeth fit attention to the governor. He is somewhat of an ornithologist, knoweth all about cranes and crows, kites, tumblers, and cocks for hengines, and, morever, maketh wire ducks to aid his resonant steam eagles to fly. He is also somewhat of an entomologist, understanding flies, crabs, worms and such likes, and not above taking notice even of a cow's ticks (acoustics?). Though partial to hydraulics he is not otherwise a rollicking man, yet he is at home in high dressed attics, (hydrostatics?) where he often maketh use of new mattocks (pneumatics?) in his area speculations. He is a peaceful man though well versed in triggernometry, and in the habit of making great use of switches in various ways. He is of leveling tendencies, yet sometimes wisheth he were monarch of all he surveyed. He is the most progressive of mortals, axing his way through forests and picking it through rocks, and, paradoxical as it may seem, he opens a country by putting locks on the rivers and keys on the banks.

RAILWAY NIGHT-MARES. — Under this suggestive head our readers will find, in another column, a graphic and amusing article, written by Charles Dickens for the *Household Words*. It is possible that some of our readers may find in it, as applied to themselves, something more than a mere fit of the nightmare. In an article published in a previous number of the work referred to, the writer represents "the Direct Burygold" and "the Great Deadlock Railways" as *great rival lines*, the former under the management of Mr. Jupiter Bristles, "a man fully impressed with the importance of his position, and never so happy as when in the board-room, or puffing along the platform of the London terminus, with guards and porters touching their caps to him on every side;" the latter under the management of Mr. Mercator Flint, a thin, severe man, with a crane-like neck, always enveloped, night and day, in a stiff Brummel tie." The competition was carried on so sharply between these two rivals that passengers were carried two hundred miles for eighteenpence; then comes a grand smash-up, and government is represented as undertaking the permanent management of the Deadlock line, with the usual circumlocution system, the nature of which we shall present in our next issue. The whole article is a piece of truthful sarcasm, well calculated to aid in reforming railroad abuses; and if it would not be thought uncharitable, we could justly apply it to the management of the great rival lines in this country, whose "savagery is that dreamy, listless, quiet, bone-crushing appearance of destructive power" so fearful for the poor stockholders to contemplate.

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VOL. I., NO. 1.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, JULY 2, 1859.

THE FATHERS OF PHILOSOPHY.

HE wondrous capacity for happiness — physical, intellectual and spiritual — with which the Creator of the Universe has endowed man, would have been but goodness wasted, had not God, in his grand creative actions, surrounded us with objects capable of imparting that happiness which we are so fitted to receive. Thus, the configuration of the surface of the earth, the surging billows of the ocean, and the gentle ripple of the quiet river or the silent lake, with the varied forms of animal and vegetable life, give enjoyment to the physical organization of all animals, through the senses; while the investigation of the causes of the changes in the forms of matter, and the phenomena that everywhere surround us, fills the intellect with a pleasure such as no other task can give; and the contemplation of the Author, his designs and purposes, the methods of his goodness, and the stability of his laws, melts the soul into a rhapsody of praise, that should be the grand anthem of the human race.

Previous to the birth of Christ, all intellectual and spiritual thought and investigation came under the common name of Philosophy, and it was not until the "good news" had been promulgated among men, as something spiritual only, that the division into philosophy and religion took place. It is with the former that we have to do; to trace if possible the history of investigation from Thales to to-day, and also to endeavor and discover the relation to, and influence of the fathers of philosophy upon the opinions and information that we call our own. For it must be recollected that while we owe much to invention, we owe more to the principles of which inventions are but the application, and to the men who first enunciated them, throwing them like lightning-flashes of truth through the darkness of ancient ignorance and kindling a flame which has lighted the world ever since.

THALES.

Although the Greeks referred to the Brahmins, Magi, and the Hebrew and Egyptian priests, as the founders of physical investigation, and there is much evidence to prove that they were men well versed, more in the mysteries of nature than in its secrets capable of daily application, yet to Thales, the founder of the Ionic sect, belongs the honor of being the first who made the study of the phenomena of nature his life-work and mission. His parents were Phœnicians—those Yankees of the ancient world; and he was born (about 580 B. C.) at Miletus, in Ionia, a country in Asia Minor, and whose people were the most famous among the Greeks. So intense was his love of knowledge that he declined being married, thinking that married life would interfere with his purposed study. To further abstract himself from the world, he committed the care of his estate to a sister's son, and set out for Egypt, there to acquire some of the wisdom of that truly learned priesthood. That at this time he possessed much learning cannot be doubted, for in return for the instruction in mathematics which the priests of Memphis gave him, he taught them how to measure the hight of a pyramid by the length of its shadow. Thus, he erected a pole say 50 feet in hight, and the shadow cast at a certain part of the day being 25 feet long from its base, and the shadow of the pyramid at the same time being 75 feet, then the hight of the pyramid would be 150 feet.

Thales invented several fundamental propositions which were afterwards embodied by Euclid, particularly the following theorems, viz.: that a circle is bisected by its diameter; that the angles at the base of of an isosceles triangle are equal; that the vertical angle of two intersecting angles are equal; that if two angles and one side of one triangle be equal to two angles and one side of another triangle, the remaining sides and angles are respectively equal; and that the angle of a semicircle is a right angle. He also knew something of astronomy, for Herodotus says that Thales predicted the year of an eclipse. He divided the heavens into five zones, and approached so near to the actual time of the solar revolution that he corrected the Grecian calendar and made the year 365 days long. He particularly noticed the attractive power of the magnet, and the effect of friction in exciting electricity in amber; and to both these substances he attributed a kind of animation which he supposed was the only original source of all motion; thus throwing out an idea which is held by some philosophers at the present day, and which many modern experiments have tended to prove; at least, Professor Grove has shown in his "Correlation of the Physical Forces," that the varied forces of nature are not separate and distinct, but are mere modifications of one and the same great force, whatever that is.

The school or sect founded by Thales lasted long and produced many eminent philosophers—men who labored hard in the cause of science, of whom we shall speak hereafter; and although their minds were cramped by a false theology, they discovered many wondrous facts which we now regard as common-place. Thales was called one of the seven wise men of Greece, and died through mere infirmity, at the age of ninety, while attending the Olympic games. He left behind him, for the guidance of his followers, a series of maxims, only a few of which we have space to give: "Health of body, competent fortune, and a cultivated mind are the chief sources of happiness." "Be careful not to do that yourself which you blame in another." "Stop the mouth of slander by prudence." "Friends should be remembered when absent as well as when present."

CHESS-PLAYING EXCITEMENT.

The achievements of our young countryman, Paul Morphy, in vanquishing the most distinguished chess-players of Europe, have excited in our people a very pardonable degree of national pride; hence they have exhibited a strong exultant feeling in welcoming him back to his native land as the Chess Champion of the World. He has been received with high demonstrations in several cities, and public testimonials of great value have been presented to him; while at the same time poets have sung, and sages have delivered orations in his praise. At some of these exhibitions there was a considerable display of "Buncombe," especially at the one held in Boston, where some of our scientific friends rather overdid the thing by their adulations; yet all this might be overlooked if such influences extended no further than the time and place when and where these effusions were uttered. But we regret to state that this is not the case, for a pernicious excitement to learn and play chess has spread all over the country, and numerous clubs for practicing this game have been formed in cities and villages. Why should we regret this? it may be asked. We answer, chess is a mere amusement of a very inferior character, which robs the mind of valuable time that might be devoted to nobler acquirements, while at the same time it affords no benefit whatever to the body.

Chess has acquired a high reputation as being a means to discipline the mind, because it requires a strong memory and peculiar powers of combination. It is also generally believed that skill in playing it affords evidence of a superior intellect. These opinions, we believe, are exceedingly erroneous. Napoleon the Great, who had a great passion for playing chess, was often beaten by a rough grocer in St. Helena. Neither Shakspeare, Milton, Newton, nor any of the *great ones* of the earth, acquired proficiency in chess-playing. Those who have become the most renowned players seem to have been endowed with a peculiar intuitive faculty for making the right moves, while at the same time they seem to have possessed very ordinary faculties for other purposes. A game of chess does not add a single new fact to the mind; it does not excite a single beautiful thought; nor does it serve a single purpose for polishing and improving the nobler faculties.

Persons engaged in sedentary occupations should never practice this cheerless game; they require out-door exercises for recreation—not this sort of mental gladiatorship. Those who are engaged in mental pursuits should avoid a chess-board as they would an adder's nest, because chess misdirects and exhausts their intellectual energies. Rather let them dance, sing, play ball, perform gymnastics, roam in the woods or by the sea-shore, than play chess. It is a game which no man who depends on his trade, business or profession can afford to waste time in practicing; it is an amusement—and a very unprofitable one—which the independently wealthy alone can afford time to lose in its pursuit. As there can be no great proficiency in this intricate game without long-continued practice, which demands a great deal of time, no young man who designs to be useful in the world can prosecute it without danger to his best interests. A young gentleman of our acquaintance, who had become a somewhat skillful player, recently pushed the chess-board from him at the end of a game, declaring, "I have wasted too much time upon it already; I cannot afford to do this any longer; this is my *last* game.' We recommend his resolution to all those who have been foolishly led away by the present chess-excitement, as skill in this game is neither a useful nor graceful accomplishment.

LIGHTNING BATTERIES---REMARKABLE INVENTION.

The earth and the atmosphere are vast magazines of electricity. Sometimes the heavens become illuminated for several hours with broad and successive sheets of "nature's dread artillery," a single discharge of which is capable of prostrating the loftiest tree that waves in the forest. Why cannot such a gigantic power which is furnished without cost by the operations of nature be held by bit and bridle like a noble steed and yoked at pleasure to the car of the useful arts? Franklin taught the world more than half a century ago how to rein in the fiery war-horse of the clouds, but up to the present day he has never been harnessed for useful purposes, and may not this be done now? The idea is a grand one, and M. Hippolite Charles Vion, engineer, of Paris, France, has endeavored to respond to the important question. He has invented and patented in France an apparatus for conducting natural electricity from the great laboratory of nature, and storing it up in magazines from which it is to be conveyed to operate machinery, to illuminate the streets in cities, and numerous other purposes. In hilly regions he is to conduct by rods the positive electricity from the atmosphere; and in valleys and low flat countries, he will elevate conductors and receivers to a great altitude by balloons connected to the earth by wires. The atmospheric conductors are connected by insulated wires with plates extending to a considerable depth in the earth, and the insulated reservoirs for storing up the electric fluid are situated midway between them. These are so arranged that by breaking and closing the circuit the current will be conveyed to any situation to effect the objects contemplated. As nature furnishes electricity in such exhaustless quantities, M. Vion, proposes to use it with his apparatus for the rapid development of vegetation in gardens and fields—a power which it has been shown to possess by experiments made at Kew, England, by Mr. Ronalds, but which by common means has hitherto been too expensive to employ. The ideas of M. Vion are certainly magnificent, and if his apparatus accomplishes all those operations which he proposes to execute, he will deserve a monument more enduring than that of the great Napoleon.

M. Vion has taken measures to patent his extraordinary apparatus in the United States.

AGRICULTURAL IMPLEMENTS.—For any article in this line, from a hoe to a horse-power, which any of our readers may wish to purchase, we would recommend them to correspond with LEAVITT & Co., whose place of business is over our office. L. & Co. are gentlemen characterized for honest dealing, and will supply almost any article which is to be had in this city at the lowest cash price, adding a small commission for the trouble of purchasing. See advertisement in another column.

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THE PROGRESS OF INVENTION.

If Progress is to be, as by common consent he has been, typified by a car, then Invention must be the wheels, and the tracks they leave behind them upon the sands of time are the records that are kept of Invention's doings in the literature of science and art. The most definite marks, the straight, undeviating tracks, are found weekly in the list of Patent Claims published in the SCIENTIFIC AMERICAN, and from these we purpose to cull a few of the more important discoveries and inventions, and notice each at greater length and give a more extended description than does the claim on which the patent is based.

The shingle machine is one of those machines which are distinctively American, as nowhere in the world is civilization, which implies well-covered buildings among its other luxuries, and abundant forest timber found in such close contiguity; consequently our native genius soon adopted timber to the purposes of roofing in the shingle form. Some machines saw them from the bolt, others rive them with a reciprocating knife; and the machine invented by C. G. Conover, of Jefferson, Wis., is one of the latter, and has for its object the riving of shingles from the bolt, the tapering of them in proper form to throw off the water with greater ease, and also the jointing of them by a novel automatic mechanism.

The sewing machine if not a native of our soil has at least been made a practical domestic worker here, and we notice some valuable improvements by H. H. Goodwyn, of New Orleans, La., which we regard as a most excellent addition to any of those in use. The invention is designed for regulating the tension on the upper and lower bobbins or spools of double-thread sewing machines. The upper tension arrangement produces a very easy and uniform friction on the spool, and affords the greatest facility for inserting different-sized spools. The lower tension arrangement produces a light spring or yielding friction on the bobbin, and this friction is of a fixed character and never needs lessening, but only increasing as occasion may require; and for doing this provision is made by means of an eye-elbow around which the thread may be wound once, twice, or more.

The machine for cutting barrel-heads invented by John Greenwood, of Rochester, N. Y., cannot fail to be of use where the manufacture of these useful packing contrivances is carried to the extent it is here, for the exportation of flour, transporting and holding liquids of various densities and the multifarious uses to which a barrel can be put. The invention consists in placing rotating clamps in which the stuff is secured in a sliding frame, and using in connection with them a cam and rotating dish-shaped saw and cutters, the whole being arranged to operate so that the manipulation of the machine is rendered extremely easy and the desired work very expeditiously performed.

Railroad bridges and other constructions where much wear and tear is usually taking place should as much as possible avoid materials of a perishable nature and should adopt those of the greatest strength combined with lightness that can be obtained. We find that J. T. Ham, of Covington, Ky., has obtained a patent for such a structure; being a bridge made of wrought-iron, all of the double-angle or square U-shape, which combines great strength and durability, and to prevent excessive vibration, the great enemy of wrought-iron, has introduced india-rubber at suitable points in the erection.

In winter time when our heavy snows cover the whole earth with their glistening white crystals, causing all roads, fields, and tracks, to become invisible and greatly impeding locomotion; and when the drifts in cuttings on the railroads often rise to greater elevation than the tops of the cars themselves all communication between distant places would be stopped, were it not for the snow-plows that have been opportunely invented. W. S. Huntington, of Andrusville, N. Y., has patented this week an improved snow-plow for cleaning the flanges or inner sides of the rails from snow, which is designed to be attached to the baggage, or on the front car. The invention consists in the employment of scrapers attached to shafts which have springs connected to them and so arranged that the scrapers as the car moves along are kept to their work, and are made to cast the snow from the inner sides of the rails, and at the same time allowed to yield or give, to pass over any obstruction; and they are also rendered capable of being elevated above the rails when not required for use.

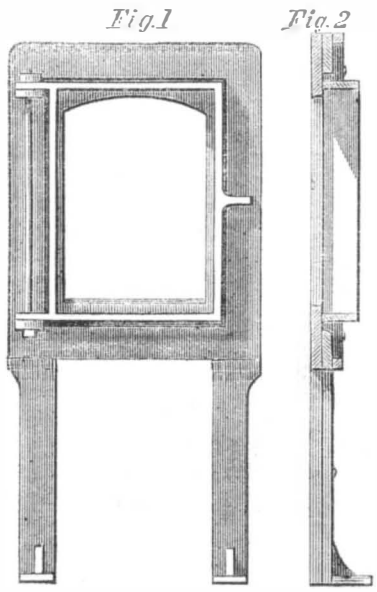
A substance so elastic and porous as cork, which requires so much skill at the workman's hands, and which necessitates the tool to be kept so very sharp, a mere observer would scarcely think could ever be cut into regular and definite forms by a machine. But such is not the fact, as there are many machines which cut corks of every size with great precision and quickness, and we observe that H. Locke, of South Boston, Mass., has produced a novel arrangement of clamps, knives, and adjustable mandrel and head, combined with suitable knife-sharpeners, with which corks for bottles and other vessels can be formed or cut very expeditiously in a very perfect manner, and by an automatic operation throughout.

Albert Philipp, of Maysville, Wis., has invented an improved sugar-cane cutter, in which four cutters are arranged on the earth-side of the same frame; two at such a distance from the ground that they cut the upper portion of the cane, and two that cut close to the bottom, a little behind the first ones, so that they do not begin to act until the upper ones have finished their work upon the cane. The several cutters on the same frame are connected by belts and driven by the same driving wheel, and they are arranged in such relation to forked arms, and their shape is such, that they draw the cane between the prongs of the forked arms and act upon it, or cut it while it is supported by the arms, and the tops when cut off are carried by an endless apron, while the canes are deposited on a platform behind the wheels by the action of horizontal reels.

The power-loom has created a revolution in all kinds of weaving, and has thoroughly "astonished the natives" of those districts where hand-loom weaving was once the staple trade; it has brought with it an increased production almost marvelous, and indeed without its valuable aid the present demand for fabrics could never be supplied. In this country the power-looms of Messrs. R. & G. Reynolds, of Stockport, N. Y., have a superior reputation in consequence of the numerous improvements which they have introduced, and they have just added an improved mode of applying brakes to power-looms and have patented the same. Their invention consists in so constructing and applying the brake of a power-loom, that it will act simultaneously upon both gears, or upon both the crank and cam shafts at the same time, thereby obviating all breakages from sudden concussions of the cogs, which are liable to occur when a single brake, that is to say, one acting only upon one gear or shaft, is used. It also consists in a certain method of applying and arranging the brake to act upon the two gears or shafts, whereby, after having stopped the loom, it is made to prevent effectually any recoil, and yet is prevented binding upon the surfaces upon which it produces friction and therefore interfering with the starting of the loom.

Now that all our towns are being illuminated with gas, the knowledge of every improvement in its manufacture or in the appliances with which it is manufactured, is especially interesting to gas-makers to teach them how to improve or cheapen the process, and to the consumer to enable him to use a less expensive or better article. We have this week to chronicle two inventions connected with gas manufacture. The first is an improvement in gas-retorts, invented by Edward Walcott, of Providence, R. I. The object of the first feature of the invention is, to prevent the formation or collection of tar in the mouth-piece of horizontal gas-retorts, which is a source of such great inconvenience in retorts, having their heads constructed in their usual manner, and to this end this feature of the invention consists in so constructing the head of the retort as to fill up the lower part of the mouth-piece, which is always cool, and present a so-inclined surface below the stand pipes that any tar which may be formed by condensation within the stand pipe, and returns into the mouth-piece, may be collected upon this surface and thereby caused to run back into the retort, where it is decomposed and converted into gas. Another feature of this invention consists in securing the head of a horizontal retort by means of an eccentric or cam and lever applied in combination with a horizontal cross-bar, so as to fasten the head by a very simple means.

The second invention is that of Paul A. Sabbaton, of Albany, N. Y., and which is represented in the accompanying engravings, Fig. 1, being a front elevation, and Fig. 2, a section. It is an improved gas-retort furnace-door, made of cast-iron, and the object of it is to protect the ironwork of the door and frame from coming in direct contact with the fire. The frame and door are constructed in such a manner that the opening of the frame is considerably larger than the furnace mouth, and the door frame itself, which is, also somewhat larger than the furnace mouth, shuts up against the brick work or against a false frame that is placed between the frame and brick



work. The door is filled with fire-brick or a slab of fire clay, which the fire cannot injure, and this only comes in contact with the fire, and as no air goes to the furnace in immediate contact with the lower part of the inside a bank of unburnt coke or other fuel protects the inside of the lower part of the frame. One of these doors will of course, last considerably longer than the ordinary ones and the trouble and expense of replacing doors so frequently, is saved. Messrs. Herring, Floyd & Kibbe, of No. 740 Greenwich-street, New York, own the patent, and manufacture the doors and the frames extensively.

We have now indicated some of the more important inventions which have characterized the week ending June 21st., and notices of many others for which we have not room here, will be found under their respective claims.

Literary Notices.

NEW AMERICAN CYCLOPEDIA, VOL. VI.—COU-EDU.—Edited by G. Ripley and Charles A. Dana. D. Appleton & Co., Nos. 346 and 348 Broadway, New York.

This volume comprises the whole of the letter D, and contains, as usual, a great amount of information not to be found in any other encyclopedia. In many instances the articles are excellent specimens of condensation, and do the authors much credit; for we do not think the power of language can go much further than, say, in the article on "Death." In a short account the theory of the "Differential Calculus" is explained, and much valuable information will be found under the head of "Diarrhea." To enumerate examples would be tedious, so we will generally remark that we are glad to see, in this work, the antique element judiciously kept in subjection, as it has been so much in the habit of over-running former encyclopedias to the damage on those subjects which require a modern treatment, and that those subjects which are of immediate interest and more recent discovery have their full space awarded to them; at the same time, we must say that in all the articles bearing on ancient literature or classic lore there is a good amount of critical acumen displayed and the best authorities have evidently been consulted. Despite the fun which a few of our cotemporaries make of this standard work, each volume, as it appears, only confirms our first impression, that it is a good, sound and useful encyclopedia, and that it is a credit to its editors and publishers as well as the numerous staff of eminent assistants who divide the labor of compiling.

THE GENESEE FARMER. Joseph Harris, Publisher and Proprietor, Rochester, N. Y.

This old established and popular journal of agriculture and horticulture commenced a new volume on the 1st of the month. It is unnecessary to commend the "Farmer." It has been published for twenty-eight years in the heart of the "Genesee country," and its friends and readers are legion. Our readers will find the publisher's advertisement in another column.

THE AMERICAN RAILWAY TIMES. Edited and published by John A. Haven, Boston, Mass.

This is an excellent and well managed journal, devoted to the interests of railways. For further particulars see advertisement.

FOWNES' CHEMISTRY. Lea & Blanchard, Philadelphia.

ATLANTIC MONTHLY for July. Phillips, Sampson & Co., Boston, Mass.

THE DENTAL REGISTER. J. T. Toland, Cincinnati, Ohio.

HALL'S JOURNAL OF HEALTH. Dr. Wm. Hall, New York.

ALL THE YEAR ROUND. Edited by Charles Dickens. J. M. Emerson & Co., Publishers, New York.

HUMPHREY'S JOURNAL OF PHOTOGRAPHIC ART. J. H. Ladd, New York.

PHOTOGRAPHIC AND FINE ART JOURNAL. H. H. Snelling, New York.

TROW'S NEW YORK CITY DIRECTORY for 1859-1860. Compiled by H. Wilson, No. 379 Broadway, New York.

ECLECTIC MEDICAL JOURNAL of Philadelphia. July, 1859. Edited by W. Paine, M.D. Published at No. 120 North Fifth-street, Philadelphia.

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FOREIGN SUMMARY—METALS AND MARKETS.

A monster anvil block of iron, weighing 21 tuns, was recently cast by Messrs. Morrison & Co., of Ousebourne, England, for the purpose of being used in the forging department where the Armstrong guns (illustrated on another page) are to be manufactured. Some 68-pounders of these guns are intended to be fabricated at an early date and placed in a battery at Tynemouth.

At a recent meeting held at Bradford, Thomas Clegg, of Manchester, presented a statement of the efforts which he had made in Africa to promote the culture of cotton. Since 1847—when he could only gather together 235 lbs. in one year—the cultivation had increased to 1,815 pressed bales in 1858; and 40 chiefs had been induced to engage in the business.

No less than 50,000 tuns of rails are required annually in Great Britain to supply worn-out material. About 3,500,000 tuns of pig-iron was made during the past year, the value of which was about $5,500,000. There are 200 iron works in operation in England and Scotland, in which an aggregate capital of $25,000,000 are invested. A vast increase in the consumption of iron has taken place during the past two years for iron steamships, houses, and a thousand other purposes, where stone, brick and wood had been previously employed.

A paddle-wheel steamboat, having its hull constructed of very thin steel plates, was recently launched at Stockton for a company at Bahia, intended to carry passengers on one of the shallow rivers in that part of South America. Its breadth is 17 feet 6 inches; length, 119 feet; draws 7½ feet of water, and is 166 tuns register.

Ten thousand dollars have recently been expended in Liverpool for public drinking fountains.

The receipts of the Paris, Lyons Mediterranean Railway, since the war in Italy commenced, have amounted to $500,000 per week. The receipts of the Lombardo-Venetian South Austrian Railway have amounted to $276,000 per week. These sums give us some idea of the cost of war to France and Austria in transporting troops to the scene of conflict in Italy. The expense of the war amounts to one million of dollars per day to the belligerent parties.

A new line of marine telegraph, 300 miles long, has been successfully laid in the Red Sea, to connect the distant British stations with the direct Indian and other lines communicating with England.

A large meeting of the Atlantic Telegraph Company was held in London, on the 8th instant; the Hon. J. S. Wortley in the chair. A report of the directors was read, and a statement of the present position and future prospects of the company presented. It was resolved to raise a new capital of $3,000,000, and the British government had guaranteed eight per cent on it, if the cable was laid and worked 30 days consecutively at the rate of 100 words per hour. Efforts had been made to obtain an unconditional guarantee, but the chairman stated that these had failed: we think the goverment acted right in demanding such conditions. Professor Thompson, of Glasgow, stated that he had the utmost confidence in the success of the next undertaking, and that more than 100 words could be transmitted in an hour. Mr. Cyrus W. Field was present looking after American interests, and he made some very judicious remarks which seem to have met the approval of nearly every one present. The present directors were re-elected, and authorized to raise the $3,000,000 in shares of $25 each. The meeting passed off in a very pleasant manner, and the directors were confident they could raise the above sum, and would lay a superior cable the next time they tried. We have now the prospect of a second Atlantic cable being laid in the course of a year or two at farthest.

The steamship *Great Eastern*, which is now stated to be in a very forward state of completion, is shortly to be thrown open to the public for inspection.

PRICES OF FOREIGN METALS, JUNE 10.

	£ s. d.		£ s. d.
Staff. bar-iron, per tun..	8 00 00	Swedish steel, in faggot	21 00 00
Single sheet.....	9 10 00	Copper in tile.....	107 10 00
Double sheet.....	11 00 00	British pig lead.....	22 15 00
Round nail rod.....	8 00 00	Tin, block.....	129 00 00
Square nail rod.....	9 00 00	Bar.....	130 00 00
Hoop iron.....	9 00 00	(Charcoal) plates.....	13 00 00
Welsh iron rails.....	5 15 00	Spelter.....	19 00 00
Staffordshire pig-iron...	3 10 00	Zinc, in sheets.....	28 10 00
Scotch pig-iron.....	2 11 00	Copper sheathing, per lb	00 1 00
Swedish iron.....	13 00 00	Brass sheathing.....	00 00 10
Swedish steel.....	20 10 00		

Few inquiries have recently been made for rails, and the ordinary American sections were easily purchased for £5 15s. per tun.

English tin plates were dull, but Banca tin was firm at £134.

The English metal market has been very quiet for some time.

For these commercial statistics we are indebted to the London *Engineer* and *Mechanics' Magazine*.

New York Markets.

FLOUR.—This is the staple food which we export to Europe, consequently the prices which prevail in our markets are affected by those which range on the other side of the Atlantic. It was expected when the war in Italy commenced there would be a sudden and great demand for American flour, and, as a consequence, speculation raised the prices for a brief period; but the expected demand not having been made, the prices have fallen from 20c. to 30c. per barrel during the past two weeks. Since June 1 up to the 21st, only 40,069 barrels were exported against 122,638 in the same period last year. New York superfine brands range from $5 85 to $6 10; fancy brands, $6 a $6 25; Ohio and Michigan, $6 25 a $7; Missouri and Canada, $7 a $9 50.

COTTON.—The market is dull, thus showing a great depression in the English manufacturing districts. The prices are very unsettled. Good ordinary Upland, Florida and Mobile, 10½c.; Texas, 10¾c. 13,142 bales have been exported since June 1 up to the 21st.

HEMP.—The market is somewhat dull at present. Manilla is selling at 5 cents per lb., and American good quality at 5½c.

COPPER.—There has been a very good demand for Lake Superior refined ingots, and quite a large number of orders have been filled up for France, varying from 21c. to 21¼c. per lb. About 250,000 lbs. have been sold at these rates. Nothing can equal American copper for making the best European brass and bronze.

TIN.—We import all our tin. The demand for it is not active at present. Banca pig has been sold for 31¼c. and 31½c. per lb., and English for 29½c. Tin plates are sold for $8 62½ and $9 50 per box according to quality.

IRON.—American rails, per tun, $51 50; American bar, per tun, $60. The inquiry for pig metal is limited, at prices ranging from $22 to $23. Quite a number of our furnaces are doing almost nothing at present.

COAL.—Anthracite ranges from $4 75 to $5 25 per tun, according to quality. Some Newcastle (England) has been selling for $7 per tun for making gas.

LEATHER.—Oak tanned sole, light, 31c. a 34c. per lb.; Philadelphia and Baltimore (made from slaughtered hides), 32c. a 35c.; Hemlock, tanned, 23c. a 25c.; Oak tanned dry hides, 26c. a 45c.; Hemlock tanned dry hides, 22½c. a 30c.; Upper leather calf-skins, 58c. a 65c.; Hemlock, 42c. a 65c.

The foregoing rates indicate the state of the New York markets up to June 23.

Trade sales of manufactured articles are advertised to commence in Faneuil Hall, Boston, on the 11th of this month. This is only the re-establishing of a commercial custom which prevailed in Boston about 20 years ago. These sales will embrace every description of American manufactured goods. They will be sold at auction, and catalogues of all the articles will be made out for buyers. It is expected that there will be a great gathering of merchants from all parts of the country, and that the display of our manufactures will be the largest and most varied that has ever been witnessed.

The Railroad Stock Market has been rather dull lately, but more has been doing in Western than any other lines. The Illinois Central shares have improved, and as the crops in this State are very promising, it is anticipated that the amount of business done on this road next Fall will be very heavy. Its bonds were sold for 83¾ last week, and the demand for them was very good.

A railroad loan of $2,000,000 guaranteed by the State of Missouri has been in our market for a week or two without finding purchasers.

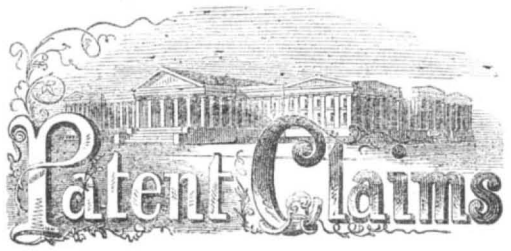
The Pennsylvania Railroad, which some of our papers ignore as having no existence, does a business equal to if not greater than any line in our country, and its stock is held in high repute at home and abroad; its mortgage bonds in London range from 91 to 93 per cent.

The business of the Northern Central (Md.) Railroad has increased from $58,725 last year, in May, to $83,532 in the same month 1859. The Pittsburg, Fort Wayne & Chicago line also increased in traffic in the same period of time from $115,404 to $137,017.

The defunct Chicago, St. Paul, Fond du Lac Railroad Company has been resuscitated under a new set of proprietors, and the name changed to the Chicago Northwestern Railway. About one hundred and thirty-nine miles of this road are completed, and it is expected that the line will be opened by the first of next November.

Locomotive builders are in better spirits regarding future business prospects. The past two years *tried their metal* severely, but "there's a good time coming."

There has been a considerable falling off in the traffic on some of our railroads this year in comparison with the business that was done on them in 1858. From reports of the directors recently published we learn that on the New York Central, the value of the traffic for the month of May last year, was $557,965, for the same month this year only $412,665. On the New York and Erie, it was $469,573, last year; only $349,953, for the same month this year.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 21, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

24,438.—John K. Barney, of Warren, R. I., for an Improved Instrument for Gaging Casks:

I claim the calliper rod, Fig. 8, the slides, 9 and 10, the triangular calliper bracket and pins, as described, and their combinations in the instrument, by which the true diameter at the bung of any cask can be obtained, however thick the sediments therein may be.

I do not confine myself to the particular manner of fastening the parts in the instrument, but to the principles of the construction of the instrument.

24,439.—R. C. Bristol, of Chicago, Ill., for an Improvement in Slide Valves for Steam-engines:

I claim the construction and arrangement of the partial rollers, E, when sustained in their respective positions, substantially in the manner and for the purposes set forth.

I also claim the described arrangement of the supported back-piece, B, loose face-piece, A, cut-off means, D, and the united passages, a b, a b, in the respective parts, A B, whereby the parts, A B, are allowed to work to a limited extent relatively to each other, without affecting the action of the steam, nor allowing an escape of the same through the joint.

I also claim, in connection with the above arrangement of the several parts, the described method of adjusting the parts, A B, relatively to each other, that is to say, working the parts, A B, for a period in a free relation, and then tightening the union by the set-screws, C C, or their equivalents, until it becomes rigid, substantially as shown and described.

24,440.—John Burge, of Terre Haute, Ind., for an Improvement in Sugar Mills:

I claim the combination and arrangement of one large and two or more small cylinders, with the strippers for stripping the leaves off the cane, and the scraper or separator for cleaning the cylinder and carrying off pressed cane, the whole constructed and operating as and for the purpose substantially as described.

24,441.—Wm. Burton, of Cazenova, N. Y., for an Improved Double Seaming Machine:

I claim, first, The use of a working head in combination with a disk, or "former," when arranged to produce an outward or eccentric draft, and at the same time accomplish the turning down of the double seam, substantially as and for the purpose set forth.

Second, The working head, a b c d, in combination with the shaft, which is adjustable up and down, and supports a tapper or straight-sided "former," or disk, and with the working head frame adjustable longitudinally, substantially as and for the purposes set forth.

[This machine is designed for turning down the double seam of flaring and straight work. The invention consists in producing a lateral or eccentric draft, by setting the lower disk or "former" out of line with the upper disk or working-head. The lateral draft insures the holding down of the fan, and a positive action of the working head upon the seam, as the pan turns with the lower disk. The working head is shaped so as to suit flaring and straight work, and the lower disk or "former," and also the working head can be adjusted to accommodate the different sizes and character of tinware. This is certainly a very simple and effective machine for the purpose intended.]

24,442.—O. S. Camp, of Fairfield, Iowa, for an Improved Boiler:

I claim a boiler made of double walls, and a single top and bottom; said top having flanges to fit against each wall, and the communication between the interior of the inner boiler, and the space between the walls being made by closed passages, such as described.

24,443.—Marion Carpenter, of Cincinnati, O., for an Improvement in Railway Chairs:

I claim the combination of the lugs, h h, k k, with the base-piece, S, for sustaining the elastic cushion and its follower in the manner and for the purpose set forth.

24,444.—J. W. Chapman, of Trinity Springs, Ind., for an Improvement in Sugar Mills:

I claim the combination and arrangement of the forked lever crushing wheels BB, bearings and table or bed timber, the table being prepared with notches, to receive the projections on the sect of the bearings and key-wedge, substantially as set forth.

24,445.—C. G. Conover, of Jefferson, Wis., for an Improved Shingle Machine:

I claim, first, The employment or use of the fence, F, in combination with a reciprocating splitting-knife, O, and reciprocating or shoving-plate, N, arranged to operate substantially as and for the purpose set forth.

Second, The reciprocating splitting knife O, shoving plate, N, tapering knives, E E, jointers, o, and clamp, K, combined and arranged to operate substantially as and for the purpose specified.

Third, Operating the bolt carriage, G, by means of the revolving arm, I, on the shaft, B, and the obliquely toothed rack, a, at the underside of the carriage, G, substantially as described.

24,446.—Reuben Daniels, of Woodstock, Vt., for an Improvement in Straw Cutters:

I claim, first, The combination with the roller, D, of the convex teeth, d, having the major diameter of their bases, arranged parallel with the axis of the roller, D, as and for the purpose shown and described.

Second, The arrangement and combination of the roller, D, cutter, C, and cylinders, E E', substantially as and for the purpose shown and described.

[The object of this invention is to obviate the difficulty hitherto attending the feeding of straw and other fibrous substances to the knives of cutting machines. This difficulty consisted in the tendency of the fibrous substance to cling around the feed roller, as the latter was engaged in feeding it to the knives. The object is attained by having the feed roller provided with teeth of a novel form.]

24,447.—Nathaniel Eames, of Hanover, Pa., for an Improvement in Hulling Clover:

I claim the combination of the screen, D, with the cylinder B, when said cylinder is provided with a spiral groove, i i, and a spiral strip of

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rubber, H, the same being constructed, arranged and operating substantially in the manner and for the purpose specified.

24,448.—Henry Ehrenfeld, of New York, N. Y., for an Improved Device for Converting Reciprocating into Alternate Circular Motion:

I claim, first, Arranging the lever, C, and dog, B, in combination with the grooved wheel, A, or its equivalent, in such a manner that the dog acts on the wheel entirely independent from the center, or hub, of the wheel, and that the lever can be brought in such a position as to impart motion to the wheel, in either direction, substantially as and for the purpose specified.

Second, The combination with the lever, C, dog, B, and wheel, A, I claim the arrangement of the groove, d, or its equivalent, in the hub of the wheel, for the purpose of keeping the dog in the proper position, and to prevent the lever from tipping over sidewise, substantially as specified.

[A lever is arranged with a dog in such a manner that the dog acts on a grooved wheel entirely independent from the hub of the wheel, and that it can be brought in such a position that by moving the front end of the lever rotary motion is obtained in the wheel in either direction.]

24,449.—A. H. Emery, of Mexico, N. Y., for an Improvement in Cheese Presses:

I claim the method of moving the follower, f, upwards, by means of the weight, h, the cords, i i, and the pulleys, j j, the whole arranged and operated as and for the purposes described and set forth.

I also claim the arrangement of the arm, a, the ratchet, w, the pinion, t, the crank-arm, v, together with the wheel, p, with the cogs either on the inside or outside, the whole being arranged and operated as and for the purposes described and set forth.

24,450.—A. H. Emery, of Mexico, N. Y., for an Improvement in Sash Fasteners:

I claim the construction of a window-sash spring and fastener of drawn pipe, with the end, g, and the end, h, arranged and fastened therein, as described.

I also claim the construction of the knob-rod, or bolt, c, as and for he purpose described and set forth.

24,451.—Thos. Evans, of Watkins, N. Y., for an Improved Attachment of Handles to Tin Pails:

I claim forming metallic ears for pails, buckets, and other vessels, with concentric angular corrugations, surrounding the bail orifice, in combination with the flattened hook a the end of the boil, provided with an additional bearing against the surface of one or more of said corrugation, ond the drop opening or downward continuation of the outer corrugation, substantially in the manner and for the purposes shown and described.

24,452.—P. H. Freylinghousen and J. G. Heilman, of Johnstown, Pa., for an Improvement in Corn Planters:—

We claim the perforated wheels, G, when hung to the sliding bars, I, and situated in respect to the hopper, a, and wheels, H, and otherwise arranged as set forth, so that on moving the said bars, I, inwards, the wheels, G, may be drawn out of gear, and the orifices of the hopper at the same time closed by the wheels.

24,453.—J. H. Gage, of Nashua, N. H., for an Improved Roll for Forming Tires:

I claim the combination of the flange, B, recess or depression, O, wide shoulder or tread, L, flange, C, and short shoulder, D, with a series of thin metallic disks, F, said parts being constructed, arranged and operating relatively to each other, substantially in the manner and for the purpose set forth.

24,454.—H. P. Gengembre, of Allegheny, Pa., for an Improvement in Retorts for Distilling Coal Oils:

I claim, first, The use an L-shaped retort, combined with charging boxes, crusher, and discharging tube, as described, capable of being subjected to a degree of temperature at the end of the horizontal part at which the residuum of the substance under treatment is discharged higher than at the upright part at which the coal is charged, the whole so arranged as to avoid the admission of atmospheric air.

Second, The combination with my retort constructed substantially as described, of a crusher suited to the material to be distilled, placed within the retort at a point intermediate between the points where the heat is highest and lowest, for the purpose of breaking up the coal or other substance before the process of distillation is complete.

24,455.—H. H. Goodwyn, of New Orleans, La., for an Improvement in Sewing Machines:

I claim, first, The combination of the loosely fitted double conical sleeve, D, with the soft leather or elastic backed and bearing eye, c, and a spring pressure, whereby the spool is brought to a proper center, and the requisite tension produced, the cone sleeve revolving simultaneously with the spool and pivoted arm, and the friction, or tension, being obtained by the action of the outer end of the double cone against the elastic eye, in the manner and for the purpose described.

Second, The arrangement with the above of the peculiar spring pressure described, consisting of the pivoted or rocking standard, B, rod, f, spring, i, and rosette or nut, h, for operation together and with the spool, in the manner described.

Third, The attachment to the stationary shell or outer case, G, of the tension arm, p, substantially in the manner and for the purposes described.

Fourth, Hanging the bobbin, F, on, and so as to rotate together with a cylinder, l, when the same is combined with a spring, m, inducing friction in the run of the bobbin, and operating in connection with a tension arm, or elbow, p, acting on thread from the bobbin, as described.

24,456.—S. F. Gold, of Cornwall, Conn., for an Improved Apparatus for Heating Buildings:

I claim constructing the generator of a series of similar cast metal metal sections, each complete in itself, and united substantially as described, so that the capacity of the generator will be governed bp the number of sections used, and may be increased or diminished by adding or removing any desired number of the internal sections.

I also claim constructing these sections, so that when united, there will exist the chambers, E, rising above the water line, and out of the draft of the furnace, substantially as and for the purposes set forth.

I further claim, in combination with the generator, the supplementary steam chambers, made up of flat cast metal sections, substantially as specified.

24,457.—Jacob Gove, of Milford, N. H,, for an Improvement in Tanning:

I claim stirring the liquor or tanning fluid in the vat, by means of a stirrer, constructed, arranged and operated substantially in the manner set forth.

24,458.—John Greenwood, of Rochester, N. Y., for an Improved Machine for Chamfering Barrel Heads:

I claim the arrangement of the sliding frame, B, clamps, C D, cam, F, lever, G, and gearing, E h, substantially as shown, in connection with the circular dish-shaped saw, Q, and cutters, R R, the whole being arranged for joint operation, as and for the purpose specified.

24,459.—Thos. Hall, of Boston, Mass., for an Improved Electro-Magnetic Machine:

I claim the combination of the spring connecting bar, H, and the switch, O, placed between the machine and the battery and operating with reference to each other, substantially as described.

24,460.—Joel T. Ham, of Covington, Ky., for an Improvement in Connecting the Iron Girders of Bridges:

I claim, first, Combining the posts and braces with the chords by means of the metal saddles, E E', and the metal stirrups or straps, F F', applied substantially as described, whereby the expansion and contraction of the chords, pests and braces, by changes of temperature, is provided for.

Second, The india-rubber blocks or springs, L L, applied between metal blocks, M N, in combination with the saddles and stirrups, substantially as and for the purpose set forth.

24,461.—A. Hotchkiss, of Sharon, Conn., and Jno. P. Adriance, of New York City, for an Improvement in Guard Fingers for Harvesters:

We claim, first, The angular cavity D, for the free admission of the front end of the face plate, C, to permit its shoulders, at the rear end to be inserted, whereby the ends of said plate are firmly secured, substantially in the manner and for the purpose specified.

Second, Confining the back end, C", of the steel face plate, C, by bending down the metal of the finger at a a, upon the reversely beveled edges of C", in the manner and for the purposes described.

24,462.—Daniel H. Hull, of Plantsville, Conn., for an Improved Trace Fastener:

I claim the combination and arrangement of metal plate, A, spring latch, C, spring, D, and knob, F, substantially in the manner and for the purposes set forth.

[Where the trace is placed upon the button there is riveted a metal plate of a somewhat elliptical form, or other suitable shape, and the trace is secured to the button by a spring-lever, or more properly, a latch, which prevents the trace from getting loose accidentally, and at the same time resisting more effectually the wear at this point.]

24,463.—W. S. Huntington, of Andrewsville, N. Y., for an Improvement in Snow Plows for Railroads:

I claim the employment or use of the plates or scrapers, E E, attached to arms, D, of the shafts, C, which shafts have springs, G, attached, and are connected to an adjusting bar, I, by means of the arms, F, and rods, H, the whole being applied to a car and arranged to operate as and for the purpose set forth.

24,464.—E. A. Jeffery, of Corning, N. Y., for an Improvement in Tools for Fastening Bale Hoops:

I claim, first, The employment or use of the combined pliers and die, B, constructed and arranged substantially as and for the purpose set forth.

Second, The combination of the pliers and hammer, A, with the pliers and die, B, arranged for joint operation, substantially as described.

[This invention relates to a new and useful implement or device for applying to bale-hoops a lock, for which Letters Patent were granted this inventor Dec. 21, 1858. The object of the present invention is to facilitate the application of such locks to the ends of hoops, and enabling the ends of the hoops to be drawn towards each other with considerable force, commensurate with the strength of the operator, so that the hoops, when locked, may fit snugly to the bale before it is relieved from the pressure of the press.]

24,465.—Wm. Johnson, Jr., of Hampstead, N. H., for an Improved Chamfering Tool:

I claim supporting the knife, F, and adjusting it with reference to the sole rest and the edge bearer, viz: by means of a carrier, A, and adjusting screws, h h i, applied and arranged with respect to the sole rest, C, the edge bearer, B, and the presser, B', substantially as described.

24,466.—K. H. Kinne, of Mexico, N. Y., for an Improved Apparatus for Cutting Teeth in Saws:

I claim the movable curved switch, p, in conjunction with the curbed groove, F, for the purpose of adapting the machine to the cutting of teeth, on setting or sharpening the teeth of straight as well as circular saws, substantially as described.

I also claim operating and feeding the burr, by means of the shaft, Q, turning within the hollow screw shaft, D, when applied to a saw-sharpener, substantially in the manner and for the purpose described.

I also claim the bed-piece, or anvil, c, for the purpose of supporting the saw-teeth while being sharpened, substantially as described.

I also claim, in combination with the burr, E, and the anvil, c, the clamps, f f, for gaging and firmly holding the saw whilst being acted upon, substantially as described.

24,467.—David Knowlton, of Camden, Me., for an Improved Ship's Capstan:

I claim fixing the shafts of the stud gears in a revolving plate, arranged to turn with the barrel and head when they are locked together, and to be stationary when they are unlocked, in combination with two stud gears, by which the head and barrel are turned in the same direction when used as a geared or simple capstan.

24,468.—Andrews Lanergan, of Boston, Mass., for an Improvement in Exhibition Rocket:

I claim making the rocket with a match, b, arranged and fixed in the choke, and protected or covered by a plane or thin disc, c, having no opening into the choke, nor any cavity or recess to hold the match or catch sparks, as described.

And I particularly claim attaching the match, as described, to the inner surface or side of the choke, or arranging the attachment, d, therein, and with respect to the lower end of the match, substantially as described, the same not only enabling the match to be confined to the choke of the rocket, but to have a portion of it, after breakage of the cap, capable of being bent downward out of the choke, into a convenient position for being fired.

24,469.—Albertus Larrowe, of Cohocton, N. Y., for an Improvement in Sled Brake:

I claim, first, Constructing the brake eyes, R R, in the peculiar form shown and described, and for the purposes set forth.

Second, The combination of the brake eyes, R R, with the brake, Q, substantially as described.

24,470.—Lucius Leavenworth, of Trumansburg, N. Y., for a Whip and Line Holder, for Guiding Horses without the use of the Hands:

I claim the arrangement of the rein-hooks or knobs, a a, which are united by one or more cross-bars or braces, and which are provided with a whip-socket, or without the same, in such a manner that a frame is formed, which, by the aid of suitable shoulder-straps, or their equivalents, may be secured to the body of a person, substantially as and for the purpose described.

24,471.—Harvey Locke, of South Boston, Mass., for an Improved Cork Machine:

I claim, first, The employment or use of a reciprocating knife-stock E, when provided with necessary knives, and arranged in combination with a rotating mandrel, N, traversing clamp, H, and feed-spout or trough, f, so that as the knife-stock moves back and forth pieces of cork, a *, will be cut from the bar or slab, T, and said pieces turned in suitable conical form, substantially as described.

Second, I claim, in connection with the reciprocating knife-stock, E, attaching the mandrel, N, and head, u, to an adjustable bar, O, fitted in the framing, A, and arranged substantially as described, so as to admit of the adjusting of the pieces of cork, a *, more or less obliquely with the knife, c, and vary the taper of the corks as may be desired.

Third, I claim placing the clamp, H, in a reciprocating plate, G, operated by the lever, Q, from the wheel, C, and the lever, R, from the reciprocating knife-stock, E, substantially as shown and described, for the purpose of giving the traversing movement to said clamp, to convey the pieces of cork, a *, from the jaws, n' o, to the mandrel, N.

24,472.—James K. Lum, of Skookumchuck, W. T., for an Improvement in Windmills:

I claim the employment or use of the fly or frame, I, placed on the arbor, J, and having the ends of the cord, i, passing through it, and attached to said arbor, said cords being also attached to the rope, W, of the weight, P, the fly being operated by the wind-wheel, in such a manner as to admit of a simultaneous rotation of the arbor, J.

[The object of this invention is to obtain a more equitable or uniform motion than has been hitherto been obtained from a wind-wheel, and at the same time to effect a saving in power, or in other words, employ all the power of the wheel, so that the same may be laid up in reserve to be used when required.]

24,473.—J. C. Lyon, of Auburn, N. Y., and Henry F. Phillips, of Seneca Falls, N. Y., for an Improvement in Grinding Mills:

We claim, first, The arrangement and combination of the clasp, i, pin, j, screw, k, hand-wheel, J, and shaft, C, whereby the said shaft and grinding cone, D, may be readily adjusted and firmly secured, whether the machine is in operation or at rest, as set forth.

Second, The arrangement and combination of the double-flanged pulley, a, shaft, C, fork, n, rod, m, and shell, L, as herein shown and described, so that by the adjustment of the shaft, C, and shell, L, will also be adjusted.

[By the use of this mill grain may be ground finer or coarser as desired, for the hub of the hand-wheel is provided with a screw, that is placed in such connection with the grinding cone and corn-cracker that by turning the hand-wheel the shaft receives a longitudinal sliding motion that adjusts the cone to grind to any degree of fineness, and its free rotation is not interfered with.]

24,474.—Perry Marcy, of Tunkhannock, Pa., for an Improvement in Potato Diggers:

I claim the arrangement of the inclined smooth belt, N, tightening pulley, u, shield, o, ratchet wheel, J, levers, a a, and bars, I I, provided with teeth, i i i, the whole being constructed and operated substantially in the manner set forth.

24,475.—James Massey, of Thomasville, Ga., for an Improvement in the Construction of Driving Shafts for Mills, Cotton Gins, etc.:

I claim suspending the driving-shaft, C, in the manner described, to allow it to rise or fall with the floor, to which it is attached, operating substantially in the manner set forth and for the purposes described.

24,476.—Thomas J. Mayall, of Roxbury, Mass., for an Improved Drainage Pipe:

I claim combining with a stationary washing bowl sink, washing tub, or other similar articles, the elastic drainage pipe terminating in a wedge shape, for the purposes and in the manner described.

24.477.—H. D. McGeorge and D. C. Greer, of Morgantown, Va., for an Improvement in Corn and Cane Harvesters:

We claim providing a corn or cane harvester with a vertical reciprocating cutting apparatus, for the purpose of cutting the stalks into two or more pieces, substantially in the manner described.

24,478.—Andrews T. Merriman, of Chicago, Ill., for an Improvement in Machines for Sawing Stone:

I claim the lowering the saw frame, by means of the long screws, s s, acting on the sliding bars, f f, and the stiff connecting rods, r r, hung with hinge joints at the saw frame, and the slidin bars, f f, (instead of chains or ropes) for the purpose of holding the saw frame steady and prevent any jumping motion, all in the manner described.

24,479.—Purches Miles, of New Britain, Conn., for an Improved Window Curtain Fixture:

I claim, first, The compound hanging bracket, capable of being raised up to permit the opening and closing of blinds, or for other purposes, as described.

Second, Constructing and combining the parts, as described, so that the bracket can be attached to the top, side or back of the window frame, and at either side of the window.

Third, Holding the band against a pulley having a friction surface, by an arm or arms, as set forth.

24,480.—Richard Montgomery, of New York City, for an Improvement in Corrugating Metallic Sheets:

I claim the waved corrugated wrought metal plate for boilers, as herein described, in combination with flat margins of greater thickness than its middle, substantially as described.

24,481.—John B. Newbrough, of St. Louis, Mo., for an Improved Instrument for Adding Numbers:

I claim, first, The bent arm, K, underlying the dial, G, so as to operate it without obstructing the vision.

Second, The stud, Q, operating in the described connection with the pawl, j, to permit the backward motion of the dial for the purpose set forth.

Third, The combination and arrangement, substantially as set forth, of the rib, N, cavity, n, catch, i, and teeth, h, operating as explained to shift the obstructing plate at each revolution of the dial, and arrest the reverse motion of the latter at the right instant in setting the machine.

Fourth, The described arrangement and combination of the pins, p p, and hook, O, operating in the manner and for the purposes set forth.

24,482.—S. Van Rensselaer Newman, of Covington, N. Y., for an Improvement in Machines for Harvesting Beans:

I claim, first, The employment or use of the rotary sickles, K K, provided with scolloped-shaped teeth, and arranged to operate substantially as and for the purpose set forth.

Second, The combination of the endless chain of rods, O, with the rotary sickles, K K, and

Third, The combination of the rotary sickles, K K, endless chain of rods, O, platform, Q, with or without the rake, o, placed in a mounted frame, A, and arranged for joint operation.

[Rotating sickles, peculiarly arranged for cutting bean-stalks, are employed in this invention, with guide-plates, an endless conveying chain, platform, and discharging rake, the whole being mounted in a suitable frame, whereby the bean-stalks are cut and deposited in gavels on the ground.]

24,483.—Andrew O'Neill, of Portsmouth, Ohio, for an Improved Fire-back for Stoves and Fire-places:

I claim the hooded damper, c, in combination with a radiating fire-back, A, constructed and arranged substantially as described, for the purpose set forth.

24,486.—James Peeler, of Tallahassee, Fla., for an Improvement in Cultivators:

I claim the arrangement of the bars, D and E, beam, A, handles, B B, and standard, C, the bar, E, forming a brace, a colter and a landside, and the bars, D, being provided with an inclined or tapering point, on which any style of blade may be secured, the two bars being pivoted together at x, and the whole operating substantially in the manner and for the purpose specified.

24,487.—Albert Philipp, of Mayville, Wis., for an Improvement in Machines for Cutting Sugar Cane:

I claim the arrangement of the cutters, H', with the forked arms, I', and with the endless apron, p, in combination with the cutters, H, the forked arms, I, the reels, J, and the additional platforms, C', to operate substantially in the manner and for the purpose specified.

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24,484.—Joseph B. Palser and Gardner Howland, of Fort Edward, N. Y., for an Improvement in Apparatus for Manufacture of Paper Pulp:

We claim, first, Having the pipe, b, which passes through the hollow journal of the boiler, divided by a partition, so that the steam may find exit through one compartment of the pipe, and the contents of the boiler through the other compartment, as set forth.

Second, The employment of the perforated diaphragm, p p', when arranged substantially as described, to protect the pipes, h h' s s', and strain the liquids from the "stock," as and for the purposes set forth.

Third, The arrangement of the boilers, J J', with the surrounding envelope, substantially as shown and described, so that the resultant liquids of the boiling may be evaporated, and also employed to cool down the boilers and surrounding envelope, as set forth.

Fourth, The arrangement of the basin, g g, below the boiler to receive the falling liquid, as and for the purposes described.

Fifth, The injection of the steam, arising from the boiling of the alkaline and other contents of boiler, J', into boiler, J, and vice versa, substantially as and for the purposes shown and described.

Sixth, The arrangement of the warming chamber, S, between the two boilers, and the combination therewith of the pipes, T V W W', as and for the purposes described.

Seventh, The arrangement and combination of the boilers, J J', furnace, A, and doors, D D' E E' F F', so as to apply the furnace-heat to either or both boilers at pleasure, substantially as shown and described.

Eighth, The combination of the cylindrical-bottomed vats, K K', having the chimneys, N N, passing through them, with the boilers, J J, as and for the purposes described.

24,485.—James Peeler, of Tallahassee, Fla., for an Improvement in Machines for Sowing Fertilizers:

I claim the arrangement of the frame, A, wheels, B B, axle, C, and apron, D, attached to the frame by means of straps, a and c, with the bar, d, metallic strip, x, corrugated wheel, F, bar, i, chuck, J, hopper, E, and slide, L, the whole being constructed and placed in the relative positions set forth, and operating in the manner specified.

24,488.—Rensselaer Reynolds and Gordon B. Reynolds, of Stockport, N. Y., for an Improvement in Brakes for Power Looms. Ante-dated Feb. 8, 1859:

We claim applying and arranging the two faces of the brake relatively to its center of motion, and the said center of motion relatively to the centers of the crank and cam shafts, in the manner substantially as described, whereby the brake is not only rendered automatic in case of recoil after the stoppage of the loom by the action of the protector, but self-liberating when the loom is started again, as fully set forth.

24,489.—Wm. Rice of Philadelphia, Pa., for an Improved Filter:

I claim, first, The general arrangement of the two casings, the perforated plates, the wire gauze, body of sand, the system of pipes, and three cocks, as described.

Second, Confining a body of sand, D, between the perforated plates, B and B', by means of a ring, C, constructed in the manner set forth, or any equivalent thereto, by which the said ring may be made to compress the body of sand without disturbing the said perforated plates.

Third, The orifices, m m, at the lower ends of the pipes, H and H', for the purpose specified.

24,490.—Christian Ritter, of Reading, Pa., for an Improvement in Cider Presses:

I claim the application of the chamfered and grooved inner slats and partitions, with their fastenings and arrangements which will produce the intended effect.

24,491.—Philip C. Rowe, of Boston, Mass., for an Improved Brush for Washing Windows:

I claim the hydraulic window-washer, or brush, constructed with the spray-jet tube, and the conduit or pipe applied to its stock and handle, substantially in manner and to operate as specified.

24,492.—Wm. G. Ruggles, of Worcester, Mass., for an Improvement made in Cooking Ranges:

I claim the arrangement and combination of the oven, D, provided with a central hollow shelf, b, the oven, G, provided with a hollow shelf, m, fire-chamber, B, damper, E, chambers, h d, flues, C H n n', substantially as and for the purposes shown and described.

[Letters Patent were granted this inventor May 18, 1858, for a cooking apparatus, and the present invention is an improvement thereon. It consists in a peculiar arrangement of a fire-chamber, flues and ovens, whereby the products of combustion are made to pass in a circular route around the ovens and through the shelvings of them, and all the heat from the ascending products of combustion is nearly absorbed before entering the smoke-stack, a small quantity being allowed to pass into the flue to keep the air therein sufficiently rarified to cause a draft.]

24,493.—Paul A. Sabbaton, of Albany, N. Y., for Improved Door Frames for Furnaces:

I claim the combination of the mouth of the furnace of the door-frame, A, and door, B, when the said door-frame is provided with an opening larger than the door into which the door shuts, so as to close against the furnace, or against a shield or false frame, C, as and for the purposes set forth and described.

24,494.—Henry Sauerbier, of Newark, N. J., for an Improved Tool for Planing and Finishing the Edges of Boot and Shoe Soles:

I claim the combination of the collis and edge plane, substantially in the manner and for the purpose specified.

24,495.—Wm. Schnebly and Thos. Schnebly, of Hackensack, N. J., for an Improvement in Harvesting Machines:

We claim the arrangement and combination of the inclined tapering discharge-trough, I, with the concave or curved platform and raker-reel, whereby the grain is made to fall from the machine in compact gavels, as shown and described.

[The object of this invention is to render the ordinary reel of harvesting machines available as a rake to rake the cut grain from the platform without at all interfering with the proper performance of its usual function, and thereby obtain a very economical, efficient and simple raking device, which is applicable to all harvesters that have reels attached.]

24,496.—Wm. Schnebly and Thos. Schnebly, of Hackensack, N. J., for an Improvement in Harvesting Machines:

We claim the employment, in combination with the pendulous levers, d d', of the toggle levers, g g, as shown, whereby the levers, d d', may, without shifting their axes of motion, f f, be thrown in or out of connection with the drivers, B B.

[This invention relates, firstly, to a new and improved means of operating the sickle, which is of the usual reciprocating kind; and secondly, to a peculiar arrangement of the sickle whereby the teeth of the same are kept in close contact without the aid of the usual cap or top bearings. The object of the invention is to simplify the construction of harvesters, and enable them to operate with far less friction than usual, and at the same time place the sickle-driving device under the complete control of the driver.]

24,497.—Jonas Smith, of Westport, Conn., for an Improved Water Wheel:

I claim the arrangement and combination of the annular gate, D, when provided with the tangential vertical plates, i, stationary rim, C, interposed between the gate, D, and wheel, A, when provided with buckets, a, having lips, c, all as shown and described, for the purposes set forth,

[To that class of horizontal water-wheels called "center discharge wheels" this invention will be found to be applicable. The invention consists in the employment of a circular gate, formed of a series of guide passages, and placed over or around a stationary rim having induction openings made in it, the wheel having peculiar buckets; the whole is so arranged that the admission of water to the wheel may be regulated as desired with great nicety, and in such a way that the greatest effect will be produced from a given volume of water, whether it be large or small.]

24,498.—Joseph Smith, of Cincinnati, Ohio, and G. B. Griffin, of Madison, Wis., for an Improvement in Measuring Faucets:

We claim, first, Operating the plunger by means of the cam grooves on the face of wheel, G, in connection with the pins on the sleeve, when both are constructed and operated in the manner and for the purpose set forth.

Second, The serrated circular register-plate, H, in connection with the ratchet, p, and pointer, m, the same being arranged and operated substantially in the manner and for the purpose specified.

Third, We claim the disc, c, constructed as described, in combination with the inlet pipe, B, and the outlet pipe, C, the same being used substantially in the manner and for the purpose fully set forth.

24,499.—John G. Stephenson, of Buffalo, N. Y., for an Improved Machine for Jointing Staves:

I claim the adjustable plates, I I, with yielding cutter-stocks or plates, K K, attached in connection with the feed rollers, D D, and yielding pressure plate, c, or its equivalent, the whole being arranged to operate substantially as and for the purpose set forth.

[The peculiarity of this invention consists of a smoothing plane or finisher, which removes with accuracy a continuous shaving, against and with the grain with equal facility; destroys the corrugations of the joint made by saws or rotary cutters, and renders the surface smooth and even. We should think this machine an excellent auxiliary to all stave machinery, and especially adapted to tight barrel work.]

24,500.—J. C. Stoddard, of Worcester, Mass., for an Improvement in Cultivators:

I claim the arrangement and combination of the slotted adjustable reversible blades, h, arms, F, and hub, e, as and for the purposes shown and described.

[A scraper wheel is employed in a certain class of cultivators for the purpose of pulverizing the soil, eradicating weeds, and earthing the plants of the crops under cultivation. This invention relates to this class, but is more especially applicable to a cultivator patented by this inventor March 29, 1859. The object of the invention is to obtain a scraper-wheel that may be rendered available for earthing various kinds of plants, and its operation otherwise modified according to the work required of it.]

24,501.—Giles M. Stone, of Fredericksburgh, Va., for an Improved Panoramic Attachment for Clocks to Indicate the Comparative Time in all Longitudes:

I claim, first, The chronometer dial divided off into 24 equal parts for indicating the 24 hours of day and night, by one revolution of the index point, substantially as set forth.

Second, The revolving disk representing the northern or southern hemisphere, for indicating the relative time of day or night, at any and all localities thereon, in the manner specified.

Third, The combination of the revolving disk with the twenty-four hour dial, for demonstrating the cause of day and night by the diurnal revolutions of the former, representing the revolutions of the earth on its own axis, substantially as described.

24,502.—John F. Sturdy, of Attleborough, Mass., for a Combined Case for Pen, Pencil, Knife, Tooth-pick, etc.:

I claim the case, A, constructed as shown and provided with the blade knife, i, operated by the spirally slotted tube, f, pencil tube, l, tooth-pick, m, and pen-slide, n, arranged and combined to form a new and improved article of manufacture.

[This invention consists in combining within a case of peculiar construction, a knife, pencil, tooth-pick and pen, whereby the several parts above named may be very compactly arranged, in a very durable manner, and as portable a case obtained as the ordinary pencil case.]

24,503.—Wm. H. Towers, of New York City, for an Improved Clothes Pin:

I claim the described improved article of manufacture, to wit: a clothes-clamp formed of two parts, A, jointed together at their upper ends, substantially as set forth.

24,504.—Cyrus B. Thayer, of Boston, Mass., for Apparatus to Hold and Turn the Leaves of Books and Music:

I claim the combination and arrangement of the wedge acting back pieces, B B, and clamps, C C, with their connecting dove-tail tongues and grooves, b b, substantially as described, so that simply raising the clamps shall unclamp and depress them, shall clamp the music sheets, as specified.

I also claim the arrangement and combination, substantially as specified, of the leaf-turning cords, D D D, arms, G G G, lever, E, and catch, m, for the purpose set forth.

24,505.—George F. Tiffany, of Palmyra, Mich., for an Improvement in Machines for Digging Potatoes:

I claim the hinged fork, P, in combination with the plow, L', when the same are arranged and operate as and for the purpose set forth.

[In front of the cart body an adjustable plow is placed, constructed with closed sides, and operating by means of a wheel placed in front of it, so as so be self-adjusting while passing over the potato hills, adapting itself to the various depths of hills, and plowing up the potatoes and sending them on to an endless riddle, where the dirt is cleaned off them, so that the device forms an excellent potato-digger.]

24,506.—Chas. N. Tyler, of Washington, D. C., for an Improvement in Manufacture of Gas:

I claim combining hydrogen gas with the volatile and easily condensible products of coal, resin, tar, etc., in their nascent state, in the manner and for the purposes substantially as set forth.

24,507.—Franklin Veal, of Hallettsville, Texas, for an Improvement in Cultivators:

I claim arranging the dove-tailed projection, i, at equal distances from the cutting edges of the shears, in combination with the slots, j, and recesses, k, in the arms and for the purpose of securing the shares to the arms, and to render them reversible, substantially as described.

[This cultivator is especially adapted for hilling and weeding young crops of cotton, corn, or root crops, as it runs between two rows throwing up the ground on each side, or it straddles two rows by a proper adjustment of the shares.]

24,508.—Jules Jean Baptiste Vergne, of Paris, France, for an Improved Screw Propeller:

I claim the arrangement of the grooving fluting or ribs in the form of a series of steps, substantially as and for the purposes set forth and described.

25,509.—Anton Von Schuttenback, of St. Petersburg, Russia, for an Improvement in Fluid Lamps. Patented in England, Oct. 11, 1858:

I claim the combination of the gas holder or gasometer, A, the vessel, I, the pipe, N, with its branches, the pipe, F, the chamber, H, the chimney, I, the oil reservoir, A, and the burner, G, the whole being applied and made to operate together, substantially as specified.

24,510.—Edward Walcott, of Providence, R. I., for an Improvement in Gas Retorts:

I claim the combination with the lid, D, of the projecting incline plane, a a, substantially as and for the purposes set forth and described.

Second, The employment for securing the lid of the mouthpiece of the retort in place of a horizontal eccentric or cam, G, and lever, H, attached to and combined with a cross-bar, F, and applied to the mouthpiece of the retort, substantially as described.

24,511.—F. F. Wagner and P. P. Dickinson, of Harrisburgh, Pa., for an Improvement in Railroad Car Seats:

We claim the arrangement and combination of the wheels, I' J arms, D D', cushions, E E', and bars, G, as and for the purpose shown and described.

[This invention consists in arranging on each side of the seat two cushions which fold one on the top of the other, and which are attached to arms that are connected by a series of gear-wheels in such a manner that the cushions attached to one side of the seat are always situated on a plane parallel to the plane which passes through the cushions on the other side, so that when the cushions on one side are used for the back of the seat, those on the other form leg rests, and *vice versa*, and by bringing the cushions in a horizontal position the seats are changed into sleeping couches.]

24,512.—Ambrose Ward, of Altoona, Pa., for an Improvement in Body Bolsters for Railway Cars:

I claim, first, The arrangement and combination of the trusses, F, center plate, D, sills, G, and tension rods, I, substantially as and for the purpose shown and described.

Second, Providing the center plate, D, with lugs, K, protecting flange or cap, b, lateral bearing flange, e, at the center, fitting into cup in plate, B, the vertical bearing flange, d', fitting into the cup or groove in plate, B, the whole combined and arranged as and for the purposes shown and described.

[The center plates are so arranged that the lateral friction between the upper and lower center plate is reduced to a very small diameter, and sufficient room is obtained for circulating the oil or lubricating matter, and at the same time the dirt is excluded by means of a flange attached to the upper plate and fitting over the lower one, and struts are cast to the upper center plate in such a manner that they form steps for the truss timbers, and the downward pressure on either side of the car is sustained by the outer rings of the center plates.]

24,513.—David Warren, of Gettysburgh, Pa., for an Improved Method of Opening and Closing Farm Gates:

I claim the arrangement of the lever, F, and bar, d, with the bar, E, and falling catch, D, as constructed substantially in the manner and for the purpose fully described.

24,514.—Henry Wells, of Walnut Grove, Ill., for an Improvement in Cultivators:

I claim the arrangement of the share, F, mold-boards, G G, rods, H H and I I, the latter having the parts, d d, formed on them, the said parts passing respectively through the bar, C, and beam, A, thus making a very firm structure, in the manner and for the purpose set forth.

[By the peculiar manner adopted in this invention of arranging and connecting together two expanding moldboards or wings and a share, the plow is made to form a furrow of greater or less width, as desired, and the plow is firm and durable and capable of being readily adjusted.]

24,515.—Solon R. Atkins and D. H. Hull (assignors to D. H. Hull), of Plantsville, Conn., for an Improved Trace Fastener:

We claim the metallic box, A, having a semi-circular ring, B, on its end, and provided with a slide, C, which is to be operated by a nob, H, and held against the neck of the button on the whiffletree by springs, D E, all arranged and operating in the manner and for the purposes set forth.

[A metal box is fitted on the end of the trace in which is placed two helical springs, which press against two lugs so as to keep a sliding plate against the whiffletree bottom. This plate is so arranged that it can be drawn back to allow the head of the button to be placed in the box, but cannot be shaken back by the motion of the vehicle.]

24,516.—Wm. Brown (assignor to himself and Fontain G. Robertson), of Shellyville, Ind., for an Improved Device for Feeding Bees:

I claim, as a new article of manufacture, the bottle stopper, consisting of the cork, A, tube, B, and cup, D D, secured together by the screw and nut, C, substantially as described and for the purposes specified.

24,517.—Walter Hunt, of New York City, for an Improvement in Heels for Boots and Shoes:

I claim making the external form of the heels of boots and shoes of a metallic shell with an inner flanch at the upper edge, to fit over the usual heel seat of the sole and between that and the counter or back portion of the upper, substantially as described, and to be provided with an inner core and the whole to be secured to the heel seat, substantially as described.

I also claim, in combination with the shell and upper flanch, and inner core, substantially such as described, making the said shell with an inner flanch at the lower edge, substantially as and for the purpose specified.

And I also claim, in combination with a heel constructed substantially as above described, and consisting of the shell with the upper and lower flanches and the enclosed core, the employment of a rotating top lift, substantially as and for the purpose specified.

24,519.—Robert H. Mathies, of Boston, Mass., assignor to A. N. Clark, of Beverly, Mass., for an Improvement in Water Gages for Steam Boilers:

I claim the combination, with the partition that separates the upper and lower main tubes, of the gage of the independent steam and water tubes or courses, arranged to unite the spaces in the main tube, substantially as specified and for the purposes set forth.

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22,518.—Wm. M. Jeffers (assignor to himself and Wm. L. Gibson), of Elmira, N. Y., for an Improvement in Double Cannon for Chain Shot:

I claim the use of a partition intermediate between the breech and muzzle of the piece, in combination with the slot, c, so arranged that the charge of the barrels shall mingle at the fuse, so that immediately on the ignition thereof the expansive force shall be wholly expended in projecting the two balls and not weakened by a continuous connection between the barrels, substantially as and for the purpose shown and described.

24,520.—H. K. Moore, of Malden, Mass., asssignor to A. W. Adams and G. W. Dane, of Boston, Mass., and Wm, G. Howe, of Haverhill, Mass., for an Improvement in Water Gages for Steam Boilers:

I do not claim the single balanced valve apparatus, constructed with the arrangement of steam-receiving and discharging chambers, A G, hollow stem or passage, E, external steam passage, a, and parts, d d.

But I claim combining therewith the auxiliary steam space, t, and the nipple or raised valve seats, s s, arranged substantially as specified.

24,521.—E. L. Pratt (assignor to himself and R. B. Fitts), of Philadelphia, Pa., for an Improved Cheese Cover:

I claim, as an improved article of manufacture, for the purposes described, a ventilating cover constructed of tin plate or other suitable material, so as to protect articles placed therein from the rays of light and heat and the ravages of animals or insects, and at the same time secure perfect ventilation, by means of a series of small perforations at or near the base or bottom for the inlet of cool air, and another series of perforations at or near the top for the escape of warm air moisture and gases, as set forth and described.

24,522.—Archibald Putnam and James H. Putnam (assignors to themselves and Philip S. Geisse), of Wellsville, Ohio, for an Improvement in Railroad Turn-tables:

We claim the adjustable spindle, g, applied and adapted in the manner and for the purpose set forth.

24,523.—Lawrence Schroder (assignor to John H. Schroder & Co.), of Cincinnati, Ohio, for an Improved Lock Guard:

I claim the arrangement of the several tumblers, in combination with intervening springs, which vary the spaces between said tumblers and operate the lock, in the manner and for the purpose substantially as set forth.

24,524.—John W. Smith, of Washington, D. C., assignor to himself and Jesse H. Whitehurst, of Baltimore, Md., for an Improvement in Gas Retorts:

I claim the described arrangement of the pipes, e and e', when combined with the retort and condensing chamber, in the manner and for the purpose set forth.

24,525.—Robt. Wm. Sievier, of Upper Holloway, Middlesex County, England, assignor to Wm. Lilley, of Ohio, for an Improved Smelting Furnace for Iron:

I claim the use of the exhaust pipe, in connection with a fan pump or other means, to exhaust the foul air and gases, and cause a current of air to pass through the bottom or apertures of the furnace of sufficient density for the smelting and purifying iron and other ores, in the manner and for the purposes set forth.

I also claim the exhaust fan, constructed and operating as explained.

I further claim the use of the movable crucible, as described, and for the purposes set forth.

24,526.—Benj. Tolman (assignor to himself and Asa F. Ramsdell), of Pembroke, Mass., for an Improved Edge Plane for Boots and Shoes:

I claim the improved edge plane, as constructed, with cutter and gage bearings, flanges and confining devices arranged on the stock and with respect to the cutter and gage, substantially as specified.

24,527.—Chas. Teuesdale and A. J. Sennett (assignors to Wm. Resor and Jacob Resor), of Cincinnati, Ohio, for an Improvement in Patterns for Casting Stove Covers:

We claim constructing patterns for stove covers and centers whit an opening in their under sides, by means of which a draw bar, f, may be withdrawn from the mold before removing the pattern, and also with a perforation, g, substantially as and for the purposes set forth.

RE-ISSUES.

James Ingram, of New York City, for an Improvement in Water-backs for Ranges. Patented February 16, 1858:

I claim protecting the water-backs of ranges by the introduction of a movable fire-brick soap-stone, or equivalent material, between the fire and said water-backs, substantially as specified.

I also claim arranging said water-back, substantially as set forth, whereby the same can be moved away from the fire to allow space for introducing said protecting fire-brick, or its equivalent, as specified.

And in combination with said water-brick, I claim the lever, k, and weight, g, or their equivalent, to move the intervening soap-stone or fire-brick, substantially as specified.

D. C. McCallum, of Owego, N. Y., for an Improvement in Bridges. Patented Jan. 20, 1857:

I claim so combining the arch chord or beam, the arch brace and the abutment or pier of a bridge, as that the thrust of the arch shall be thrown down upon the abutment or pier, and any deflection in the lower chord be counteracted by an upward force at the upper ends of the arch braces.

I also claim the method of engthening or shortening the braces of a bridge truss or girder, by which the truss may be elevated or depressed, as required, by means of the yoke, a, the plate, b, on the end of the brace, and the straining pieces, c c, with their nuts, d, substantially as described.

Charles T. Porter, of New York City, for an Improvement in Governors for Steam-engines. Patented July 13, 1858:

I claim, first In combination with arms and very small balls, or their equivalents, revolving at a velocity several times greater than would be due or natural to them, considered as a conical pendulum, the employment of a counterpoise, applied substantially as described, and so proportioned in weight as to balance, or nearly so, the centrifugal force developed by the revolution of the said arms and balls, or their equivalents.

Second, I claim the employment, at the connection between the arms and the central spindle of the governor, of a joint constructed substantially as described and illustrated, whereby each arm is brought to the outside of the joint on one side and made to thrust against the joint pin close to one end thereof at a right angle, and at a distance from the axis of revolution, as described.

[On page 36, Vol. XIV., of the SCIENTIFIC AMERICAN, we gave a very full description and illustration of this invention; since that time, however, many have gone into use, and all have given such great satisfaction that the inventor is now manufacturing them very extensively in a "model" workshop of his own.]

John A. Jackson (assignee of Israel Amies), of Philadelphia Pa., for an Improvement in Veneers. Patented Dec. 11, 1855:

I claim the embossed veneers described, the same being adapted for subsequent application in the construction and ornamenting of furniture and other articles to which veneers are or may be applicable.

Obed Hussey, of Baltimore, Md., for an Improvement in Reaping Machines. Patented Aug. 7, 1847; reissued April 14, 1857; again re-issued June 21, 1859:

I claim the combination of side and cross bearings of the guards with flush edges at or near the forks of the blades, substantially as described.

Obed Hussey, of Baltimore, Md., for an Improvement in Reaping Machines. Patented Aug. 7, 1847, reissued April 14, 1857; again re-issued June 21, 1859:

I claim scalloped cutters with their blades beveled, as described.

NOTE.—The number of patents issued last week, and contained in the above list, is NINETY-FIVE. Out of this number, THIRTY-FOUR, or more than one-third of them, were either cases on which the specifications and drawings were prepared at *this* office, or rejected cases which had been prepared by incompetent attorneys and placed in our hands for attention.—EDS.

Notes and Queries

W. M. A., of Ohio.—Notwithstanding your proposal for taking cities by flying balloons over them and then discharging from the balloon, by electricity, a quantity of combustible fluid, which shall overwhelm the fated inhabitants, we still consider that the dwellers in Gibraltar are quite safe. As to controlling it from a ship which is out of gun-shot, there was never a balloon constructed that could carry five miles of rope sufficiently strong to hold its own weight and overcome the strain upon it.

G. C. H., of N. H.—We are glad to hear that your experiment of laying eggs, small end down, in bran and saw-dust, has been successful, and we should have enjoyed eating an egg laid last August, which tasted perfectly fresh a week ago.

W. McK., of Mo.—We have no reason to think the advertiser you refer to anything else but an honorable trader. You can learn photography anywhere, and without instructors, if you have patience enough to stand a few failures in the first instance; and as for chemistry, we are sorry to say that few photographers know much about it, but we should advise you to make it the vehicle of learning that science.

A. W. R., of N. C.—You should take care to save all your scrap iron, as it can be converted into a very good quality of steel. Melt it in a crucible by the use of a blast, and mix a little charcoal and manganese with it.

L. H., of Ohio.—It is supposed that cold cast-iron, when placed among molten iron, is caused to float, either by air expanding in its pores or an electric repulsive influence between it and the fluid. These are mere theories, however.

S. T., of Mass.—Common mortar is employed for building concrete walls above ground; hydraulic cement is used for underground walls. The cement sells at $4 50 and $5. It is usually mixed, for use, with four or five times its bulk of sand.

W. B., of Pa.—A coat of oil on the outside of your lightning-rod will not affect its conducting power much, while it will prevent it rusting. You may substitute a copper joint in the ground for the iron one, but it will not render the rod more durable. For a four-story rod a half-inch conductor is sufficient, and some use a three-eighth inch rod.

G. E. S., of Pa.—The difficulty which you experience in bending plow-handles may be in the mechanism you employ, not the steam. The outside of the bend should be gently drawn out while upsetting, and the inner side of the curve should be gently compressed. Use low-pressure steam for softening the timber; do not keep the handles too long in the steam-box.

W. R. Jackson, of Baltimore—Wishes to hear from the following parties, as to their address, &c.:—Baldwin's Turbine Wheel, SCIENTIFIC AMERICAN, No. 51, 1857; Stevenson's Pea-Sheller, No. 438, Third-avenue, New York; Rowe's Plumb and Level Indicator; Heich's Egg-Beater; Mason's Improved Porte-monnaie.

J. R. M., of Mo.—The executor of a deceased inventor must divide the proceeds of any patent secured after the patentee's death, among the heirs at law. A young man under 21 years of age may buy and hold property in his own name if he has no parents, for in such a case the State becomes his guardian. Water in springs situated on magnesian limestone formations is the cause of bilious complaints to strangers. Clarke's work on locomotives is the best you can use to instruct you in setting valves, &c.

R. A, W., of Miss.—A screw-propeller will act on the atmosphere to propel a balloon, and it has been tried for this purpose; but for want of a proper resisting medium to act against, it is very inefficient in such an element. If you try the experiment you will find that it is impracticable, in an economical point of view, to propel wagons and cars.

E. F. B., of N. Y.—We can see no identity between iron, hydrogen and electricity, in the spongy iron to which you refer as having taken fire. The iron, no doubt, took fire by combining with oxygen, but why it acquired such a great affinity for the oxygen is a mystery to us.

E. W., of N. H.—During the pending of an application for a reissue, the patentee has a perfect right to sell territorial rights and machines, because the term of a patent begins with its date and involves no season of intermission until it expires.

H. H., of Pa.—A strong solution of isinglass is an excellent cement for leather shavings. A good black varnish for steam cylinders is made with asphaltum dissolved in warm turpentine.

W. C., of Pa.—Cocoanut-shell can be partially softened by steaming it, and in that condition, while hot, you can mold it by pressure in a die. Boiling it in warm water also softens it.

J. H. L., of Ohio.—The idea you suggest, of attaching a photographic likeness of a traveler to the government passport, is a very good one, but it could not possibly be patented.

J. H. S., of Ind.—Your communication will appear in due time.

W. C. F., of Mass.—For the information you require we cannot do better than refer you to "Brewster's Optics."

G. F. S., of La.—There is no article better adapted for painting the bottom of skiffs than white lead.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 25, 1859:—

W. D. S., of Pa., $25; G. H. & S. F., of N. Y., $25; E. G. C., of N. Y., $30; E. D. & Z. W. L., of Ga., $30; P. M. S. & Co., of Tex., $30; C. W. R., of Pa., $55; J. L. M., of N. Y., $30; J. M., of O., $20; A. W., of Ct., $30; J. A., of Mass., $250; A. L. S., of Ind., $25; J. B., of Ill., $25; Van V. & T., of N. Y., $30; D. A. W., of Ga., $25; G. C., of N. Y., $55; D. C. B., of N. Y., $25; W. P. V., of Me., $10; I. D., of Ct., $30; A. H., of Tex., $50; A. C., of N. Y., $30; J. B., of Ind., $25; A. W., of Vt., $25; G. M. Jr., of Ill., $30; C. B., of Pa., $57; W. A. S., of N. Y., $30; W. A., of Ill., $30; J. McD., of Ill., $25; H. J. H., of Mass., $25; J. R., of Pa., $29; S. B. T., of Ct., $32; T. A. D., of N. H., $50; O. G., of Ill., $30; A. McA., of N. Y., $30; T. T. C., of Tex., $30; E. B., of N. Y., $10; R. P., of Ct., $25; J. W., of R. I., $30; Van H. & A., of Mo., $25; K. & F., of Tex., $55; H. T., of N. J., $30; G. J. C., of Ill., $30; A. G. M., of N. Y., $5; G. C., of N. Y., $25; L. A., of O., $30; S. B., of N. J., $10; H. B., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 25, 1859:

R. S. P., of Ct.; W. P. V., of Maine; G. & M., of Pa.; G. E. H., of N. Y.; A. L. S., of Ind.; J. B., of Ill.; A. G., of N. Y.; D. A. W., of Ga.; A. W., of Vt.; H. B., of N. Y.; J. B., of Ill.; N. B., of N. Y.; J. McD., of Mich.; G. C., of N. Y.; S. B. T., of Ct.; J. R., of Pa.; G. H. & S. F., of N. Y.; W. D. S., of Pa.; T. D. R., of N. Y.; H. J. H., of Mass.; E. B., of N. Y.; C. W. R., of Pa.; G. C., of N. Y.; D. C. B., of N. Y.

Rates of Advertising.

Thirty cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining Patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. We also furnish a Circular of information about Foreign Patents.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Communications and remittances should be addressed to

MUNN & COMPANY,
No. 37 Park-row, New York.

R. B. FITTS, No. 617 SANSOM-STREET, PHILADELPHIA, PA.—Commission Agency for the Sale and Management of good Patented Inventions. Also, genuine good Inventions patented on equitable terms. 1 2*

HARRISON'S GRIST MILLS—20, 30, 36 AND 48 inches diameter, at $100, $200, $300 and $400, with all the modern improvements. Also, Portable and Stationary Steam-engines of all sizes, suitable for said Mills. Also, Bolters, Elevators, Belting, &c. Apply to S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

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IMPLEMENTS OF WAR---RIFLED GUNS.

The proper equipment of armies forms one of the most prominent features in the science and art of warfare. The highest military skill and the most impetuous courage may all be expended in vain, unless accompanied with effective implements of war. All the genius of an Alexander and all the valor of Rome would be valueless with the spear and the bow before an army of dolts, armed with rifles and artillery. Modern warfare is distinguished for effective weapons of destruction, and prominent among these are rifled fire-arms. American rifles told fearfully among the British ranks, during the two wars which we have had with the mother-country; yet it is a curious fact, that, until within a very few years the military authorities of no nation considered this weapon the best for an entire army. It was deemed the most effective for select corps of skirmishers, but for regiments of the line it was held to be inferior to the musket. Within the past six years, however, a complete revolution has taken place in the armies of all nations on this subject. "Brown Bess" (the old musket) has become obsolete, and every soldier is now armed with a rifle. France led the way in this army reform by the use of the *Minie* ball. This consists of a conical bullet with a chamber in its rear end, and the centre of gravity near its front. The old rifle bullets were round, and were cast to fit the muzzle of the rifle so tightly that it required great force to ram them down. It was a difficult and slow operation to load the old rifles, hence they were inferior to muskets for rapid advances and quick murderous discharges in the ranks. The conical bullet with its chamber in the rear is made to pass down the barrel of the rifle freely; and when it is discharged, the lead expands, presses into the spiral grooves of the barrel and thus the bullet is projected with a spinning motion on its mission of death. With the conical expanding bullet the rifle can be loaded as rapidly as the musket; its range is increased to triple the distance, and its accuracy is wonderful. The deadly fire of the French and British rifles was felt by the Russians in the Crimea; and since that war, our own military authorities and those of every other nation have laid the musket aside with the old bow, and have equipped their soldiers with the rifle.

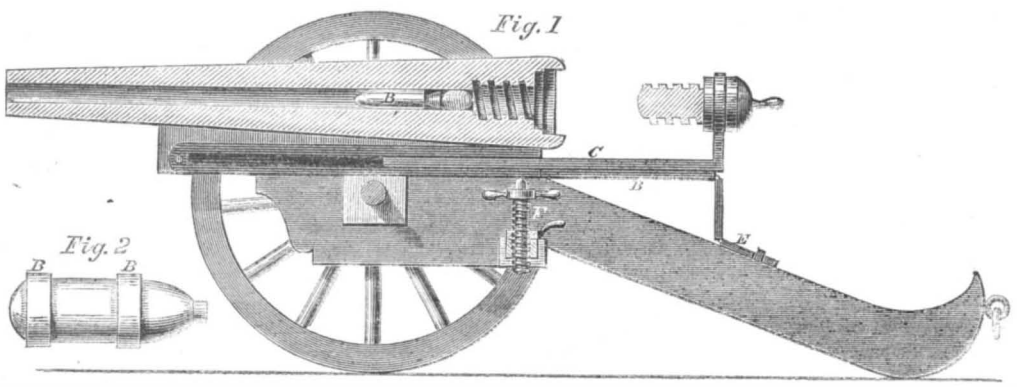
The Prussian army is mostly supplied with breech-loading rifles, but all other armies use muzzle-loading ones. The latter are the most simple, yet, we think, the breech-loaders will yet supplant them. A whole host of such rifles have been brought before the public, such as Sharpe's, Smith's, Marston's, Symmes', North's, the Volcanic, and others, mostly American inventions; and from the nature of some of these, we are of opinion, they must eventually find more favor than they do at present among military authorities.

The efficiency of the rifle for the individual soldier having been demonstrated, the application of the same principle to cannon was a desideratum. As cast-iron bullets are employed for large guns, of course, they were inapplicable to rifled cannon. By coating such bullets with rings of lead, however, to prevent the stripping of the grooves, the success of rifled cannon was ensured, and both the French and British military authorities have adopted them for their armies.

The Armstrong rifled cannon has obtained a great notoriety, and has gained for its inventor, Sir William Armstrong, a knighthood. The accompanying engravings illustrate it very fully: Fig. 1 being a longitudinal vertical section of the cannon, and Fig. 2 a view of an explosive ball which may be employed with it. When the pin F strikes an object, it explodes a charge of percussion powder inside, and the ball bursts to pieces with destructive violence. B B are the bands of lead around the cast-iron shell. The carriage is of the usual form; the cannon is constructed with a steel core, which is bored out and rifled, and over this wrought-iron spiral bands are subjected to heat and shrunk, so as to combine great strength and tenacity. A conical bullet B is shown in the cannon, and it has a sabot in its rear chamber like that of a "Norton bullet." The breech entrance is a hollow screw, and the breech a screw-bolt, which is pushed back and forth on its slide C; then the screw is turned in its nut and the breech closed. B is an elevating platform, and E is a stop to support it. F is an elevating screw and a tightening nut. The elevating arrangement and the slide to the screw-breech are improvements recently made by W. Gosling, of London. This is the rifled cannon which our British cotemporaries state is to give them advantages in artillery warfare over every nation in the world. Sir William Armstrong states that at a distance of six hundred yards an object no larger than the crown of a man's hat can be struck with it at almost every shot, and at three thousand yards a target nine feet square (which appears like a mere speck at that distance) can be struck five times out of ten shots. It is four years since experiments were commenced with this gun, and a large factory has been erected for manufacturing them at Newcastle. The first cannons to be made are nine, twelve, and eighteen pounders for the army, and after that large rifled guns will be supplied to the navy and the fortifications. It is no doubt a most deadly weapon of war, but those which are employed in the French army are stated to be equally as good; and there is nothing so very wonderful about it that cannot be copied and produced by our own armorers. The *Springfield Republican* states that this cannon is a breech-loader on the principle of Sharpe's rifle; but this is not exactly correct, as Sharpe's rifle has a sliding butt for a breech-closer, while the Armstrong cannon has a screw like the Prussian needle-gun. Our cotemporary, however, gives an account of some very interesting experiments which have lately taken place at the Ames' Manufactory, Chicopee, Mass., with rifled bronze cannon, and from these we learn that any cannon may be rifled and made more efficient; also that conical shot are more accurate, and have greater range with the same quantity of powder than round shot.

Had the Armstrong gun been constructed with a sliding breech like the Sharpe's rifle it would be more serviceable. It appears to us that the screw-breech will be liable to such expansion by heat after several rapid discharges that it will become fast in its long hollow nut, and thus rendered almost impossible to operate. It seems to be self-apparent also, that this cannon may be as rapidly loaded from the muzzle as the breech. In the former case the charge has but to be rammed in to a greater distance (the whole length of the gun); while in the latter the breech has to be unscrewed, pushed back, the charge forced in, and the breech again brought forward and screwed up—a succession of complicated and tedious operations.

We are of opinion that rifled breech-loading cannon must yet come into general use. It will probably require many small improvements to render them perfect in action, but the principle involved in their superior range and accuracy must gain for them the first place in destructive warfare. The din of battle comes floating to us across the Atlantic and from beyond the Alps. Two great nations are engaged in Italy in desperate warfare, and thousands have already perished by the bullet and the bayonet. It is difficult to predict what may be the result. All Europe may yet become engaged in the struggle, and we also may become involved to some extent. The wise saying of our wisest general and statesman, "In time of peace prepare for war," should never be forgotten, and we cannot be prepared for such an emergency unless we adopt in season the most efficient weapons of war—the best rifled cannon.



THE ARMSTRONG GUN.

PAVEMENTS PAST AND PRESENT.

The authorities of our city have just resolved to remove what is called the "Russ" pavement in Broadway, and substitute the "Belgian" pavement. The former is composed of large granite blocks laid in concrete; the latter, small granite blocks well rammed down in sand. The Russ or old Roman pavement is very durable, but it affords no foothold for horses, numbers of which are daily falling upon it. Nine years ago, on page 229, Vol. V., SCIENTIFIC AMERICAN, we recommended the act that is now about to be performed; and we illustrated the method of constructing the small granite block pavement on page 293 of the same volume. We then suggested that the large blocks should be cut in several pieces to form the new pavement; and we understand this will be done in this case. Quite a number of our streets have been laid with the Belgian pavement, which have given great satisfaction thus far, but it was not for several years after we recommended it that a single block was laid. It would have been a saving to the city had our suggestions been acted upon at an earlier date, but "better late than never."

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